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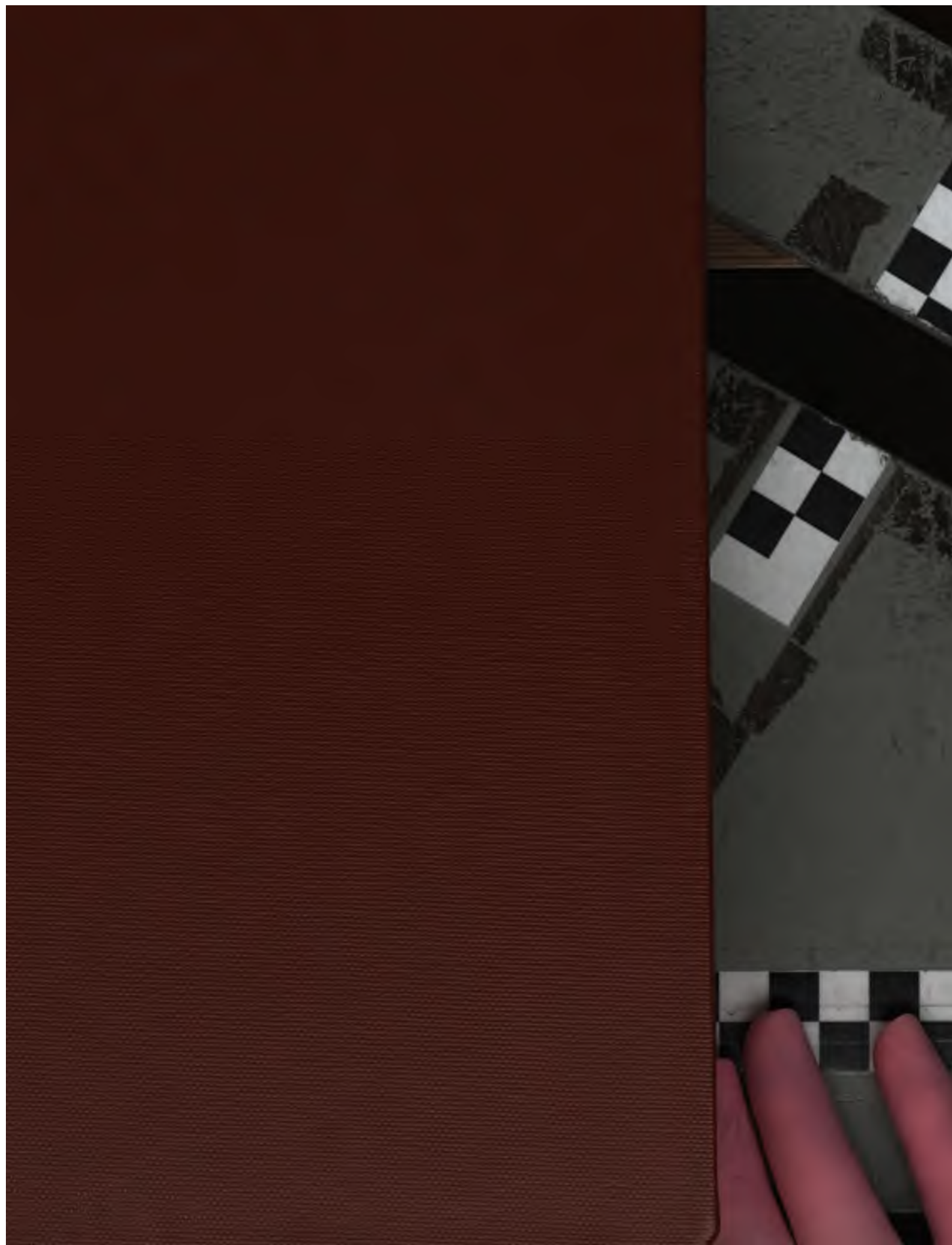
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BULLETIN
OF
THE CARNEGIE FOUNDATION FOR THE
ADVANCEMENT OF TEACHING

PAPERS RELATING TO THE ADMISSION OF
STATE INSTITUTIONS TO THE SYSTEM
OF RETIRING ALLOWANCES OF THE
CARNEGIE FOUNDATION

NUMBER 1

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INTRODUCTION

IN his letter of April 16, 1905, to the members of the Board of Trustees whom he had selected, Mr. Carnegie referred to the admission of government institutions of learning to the benefits of the retiring allowance system which should be established in the following words: "We have, however, to recognize that state and colonial governments which have established or mainly supported universities, colleges, or schools may prefer that their relations shall remain exclusively with the state. I cannot, therefore, presume to include them." In accordance with the policy here expressed, Mr. Carnegie did not include in his list of trustees any representatives of state institutions.

The Act of Incorporation under which the Carnegie Foundation for the Advancement of Teaching is conducted was framed upon the lines of Mr. Carnegie's letter, and while it does not include state universities by name among those who are entitled to a share in the retiring allowance system thus established, it does not specifically exclude them.

In view of this fact and in view of the great advantages of a retiring allowance system, the representatives of state and colonial institutions of learning have presented to the board in various ways their requests for a consideration of the claims of these institutions. The National Association of State Universities presented some months before the annual meeting a formal statement on the part of that association, and asked that representatives of the association might be heard in this cause at the annual meeting.

Realizing the educational importance of the question, the Executive Committee of the Carnegie Foundation for the Advancement of Teaching has desired to give every opportunity to the representatives of state and provincial universities to present their case. Papers prepared by their representatives were printed in advance of the annual meeting and sent to each member of the board of trustees, so that they might be carefully studied in advance. In addition, the trustees received at their annual meeting President Charles R. Van Hise, of the University of Wisconsin, and President George E. Fellows, of the University of Maine, designated by the National Association of State Universities, who made a verbal explanation of the paper which had been presented and answered such questions as the trustees desired to ask.

The Association of Land Grant Colleges did not present a formal paper to the trustees, but President H. C. White, of the University of Georgia and of the Agricultural College of that state, was present on the part of land grant colleges, and made a statement in their behalf before the trustees and answered also such questions as were addressed to him.

After these papers had all been laid before the trustees at their annual meeting of November 21, there was presented by the president of the Carnegie Foundation for the Advancement of Teaching a memorandum showing the draft which this request would make, if granted, upon the resources of the

Foundation, and presenting at the same time certain arguments with respect to the general policy involved.

The trustees did not take final action, referring the whole matter back to the executive committee for the preparation of further data, and leaving the final decision to a later meeting. It should, however, be said that an unofficial expression of opinion indicated that a large majority of the trustees did not believe that the state institutions should look to the Carnegie Foundation for the establishment of their retiring allowance systems.

Realizing the keen interest in this question on the part of all teachers and others connected with education, the executive committee believes that the publication of all the papers presented at the annual meeting of the trustees will serve a useful purpose. These papers have been therefore included in this bulletin, and they embrace the following documents:

- I. A memorandum on the part of the National Association of State Universities.
- II. A memorandum by Acting President Maurice Hutton, of the University of Toronto.
- III. An argument in favor of the admission of state universities by Professor Henry T. Eddy, Dean of the University of Minnesota.
- IV. A memorandum submitted to the Trustees by Henry S. Pritchett, President of the Carnegie Foundation for the Advancement of Teaching.

H. S. P.

I

STATEMENT PRESENTED ON BEHALF OF THE NATIONAL ASSOCIATION OF STATE UNIVERSITIES

*To the Trustees of The Carnegie Foundation for the Advancement of
Teaching:*

The executive committee of the National Association of State Universities respectfully requests in the name of that association, that state universities be included among the institutions receiving grants from the Fund for retiring allowances.

That they come under the description of institutions in Mr. Carnegie's grant appears from the following:

1. No state university is in any manner under, or controlled by religious organizations, and no acts of incorporation or charters provide that any denominational or sectarian tests shall be applied in choosing the trustees, officers, or teachers, nor in the admission of students. It is very often the case that in the faculties of these universities are to be found members of all religious organizations, Protestant, Catholic, Jewish, and in some cases men of Oriental religions, and of no religious affiliation.

2. Next, state universities in all cases known to this committee, rank as colleges under the educational standard set by the Carnegie Foundation. If there be any exceptions they are at present unknown to the committee, viz., the state universities have "six or more professors giving their entire time to college and university work," and a course of four full years in liberal arts and sciences is maintained, and the requirements for admission are "not less than the usual four years of academic or high-school preparation or its equivalent, in addition to the pre-academic or grammar studies."

3. While it may not be true that every state university has a definite productive endowment of "not less than \$200,000" according to the requirement of the Carnegie Foundation, it is true that every state university has by definite appropriation annually from the state or the United States, or both, a sum as large as or larger than the interest on an endowment of "\$200,000." According to the latest statistics from the state universities, \$18,000 is the smallest sum annually appropriated to any state university by the state in which it is located. This, reckoning four per cent as a basis of income, would be the income on \$450,000. Of course many state universities have already the requirement of "an endowment of \$200,000" or more.

4. Further than this, it seems unlikely that any state will definitely make a retiring fund for the professors in the state university, as such an action might raise the whole question of pensions for all state officers.

It is already known that the trustees of many state universities would welcome the provision for pensions by the Carnegie Foundation. While some states might not wish to accept these pensions, that ought not to prevent those who desire them and need them.

5. The salaries in state universities do not vary essentially from those in other institutions which would be included in the list participating in the benefits of the Foundation. Many of the state universities have grown by the struggles and self-sacrifice of individuals who have given their time to the development of state universities as others have to privately endowed institutions, and in their old age find themselves unable to call upon any corporation or individual for assistance. In this respect it would seem that professors who have served state universities are in a worse condition than those who have served private institutions.

6. The question should perhaps be considered also as to the effect upon the development of the state universities themselves if the state universities should be recipients of the Carnegie Pension Fund. Is there any reason to believe that the granting of pensions to professors in state universities would weaken the support of the states to such universities? It seems to us that not only is there no danger of this, but that providing for pensions from other sources than the state will overcome a very considerable obstacle in reference to the further development of state universities.

At the present time many state universities have funds from private resources which have been granted because of the reluctance of the state to provide for the particular purposes supported by such funds. Among the subjects which are supported in state universities by private funds is research. Perhaps the most important gift which any state university has received for the advancement of research is the Lick grant for the founding and maintenance of the Lick Observatory in California. At many state universities scholarships and fellowships are supported by private funds. This has come as the result of a special appeal by the state university officials for funds of this kind because it was felt that it would not be wise to use state funds extensively for this purpose.

State universities will certainly be at a great disadvantage as compared with private institutions if no pension fund is granted. But if the state universities are admitted to the advantages of the Carnegie Foundation they will be placed upon the same footing in this respect as private institutions. If, however, the Carnegie Foundation declines to accept the professors of state universities as recipients of the pension fund, the state universities will be in the dilemma of being at a disadvantage as compared with other institutions, or else providing pension funds to its officers contrary to the established policy of all the states in this respect. The latter course they would find difficult to defend, and thus if the Carnegie Foundation declines to recognize the state universities they will be obliged either not to grant the pension and thus be at a disadvantage, or to grant a similar pension fund and be in a position difficult to defend before the state. Therefore it seems clear not only that the granting of the Carnegie Pension Fund to professors in state universities

will not prevent their advancement, but will relieve them from a serious embarrassment which they otherwise will be obliged to face.

Respectfully submitted by the Executive Committee of the National Association of State Universities.

R. H. JESSE, *President*
University of Missouri
C. R. VAN HISE, *President*
University of Wisconsin
G. E. FELLOWS, *President*
University of Maine
R. B. FULTON, *Chancellor*
University of Mississippi
G. E. MACLEAN, *President*
University of Iowa

SEPTEMBER 10, 1906.

II

MEMORANDUM SUBMITTED BY DR. MAURICE HUTTON, PRESIDENT *PRO TEMPORE* UNIVERSITY OF TORONTO.

The obligation of the state toward universities as regards pensions does not appear to be recognized to any appreciable extent in the United States or Canada; nor is the value of a system of pensions generally recognized by the public as a means of increasing the efficiency of universities by rendering the career of a university teacher more attractive to men of the highest talent or by enabling universities to dispense with the services of professors whose powers have declined through age or infirmity.

That this is the case in Ontario is shown by the fact that, whereas in the earlier history of the University of Toronto retiring annuities were occasionally granted, in 1891 the authorities decided against the continuance of such provision, and there now exists no regular pension system in connection with this university.

As a substitute there was created in 1891, as a final settlement of the question, what is called the "Retirement Fund," which however is nothing more than a system of *enforced saving* by deducting monthly from the salaries of members of the Faculty a certain percentage which increases with the salary according to a fixed scale.

The interest credited to this "Fund" is six per cent per annum, compounded half-yearly. This is but one per cent greater than could be obtained were the members of the staff permitted to accumulate and invest for themselves. Even this six-per-cent rate was at one time threatened with reduction by the Government to four and one-half, and was retained only after a vigorous protest on the part of the professors. The contribution which the Province thus made to the "Fund" is at once insignificant and uncertain.

In many cases this compulsory-saving system, involving as it does the forfeiture of control of *their own money* by members of the staff, has resulted in positive hardship: (1) Individuals have not had sufficient surplus income properly to insure their lives, and in case of death dependents have been left destitute. (2) Individuals, having no control over their own savings, have been unable in the past to purchase homes for themselves, and the rapid increase in values in Toronto has made rents excessively high, with corresponding curtailment of resources.

The "Retirement Fund" has now been in operation for fifteen years, and the amounts to the credit of members of the staff vary from a few hundred to nearly seven thousand dollars. Even these largest amounts, owned but not controlled by professors approaching the age of retirement, would purchase for them annuities of but three or four hundred dollars, and *it is to be remembered*

that these would be purchased by their own money and not by money contributed by the state.

It is felt that the trustees of the Carnegie Foundation will appreciate the utter inadequacy of the provisions for retirement in the University of Toronto, and in view of this inadequacy it is hoped that the trustees will include this university among the beneficiaries of the fund administered by them.

III

COMMUNICATION FROM PROFESSOR HENRY. T. EDDY, DEAN OF THE GRADUATE SCHOOL, UNIVERSITY OF MINNE- SOTA

DR. HENRY S. PRITCHETT,
President of the Carnegie Foundation,
542 Fifth Avenue, New York.

My dear Dr. Pritchett:

In a recent circular issued under your direction is a statement that your board is to proceed, at its coming meeting in November, to the consideration and decision of the question whether the benefits of your system of pensions shall include the staff of the state universities or no, and that all parties interested will have opportunity at that time to present any considerations germane to the subject. Since I shall be unable to be present at that hearing in person, I beg your leave to offer in writing certain reasons why, it seems to me, the state universities ought to be included within, and not excluded from, the circle of those institutions which it is the hope and expectation of the founder of this great benefaction to influence in their future educational life history.

I write this not because I doubt that the able men who will argue the question before your board will discuss it in all its phases, but because my interest in the objects set before you for attainment is great and because I may possibly add emphasis to some considerations which might otherwise be lightly passed over; and in doing this I also take the liberty of expressing myself at length in such detail as might not be suitable were I addressing your board as a whole, whose sittings may be too brief for such statements. I trust, however, that you will not regard this as trespassing too much upon your time and patience personally, for I am persuaded that all matters bearing upon this question are receiving most serious and prolonged consideration by you.

The relation which the state universities sustain to the state and to the public in this country is one whose history is so recent and record so brief that we may easily trace the origin of the wide difference between the control, or lack of control, exercised over them by the state legislatures which support them, and the state control of the universities of Germany, Austria, and France, where public education is definitely one of the departments of governmental administration, to be most minutely arranged for and thoroughly considered in all its details. This differs *in toto* from the connection of our state universities with the state. Over these no responsible state official has control. The management of the state universities is modeled after that of the privately endowed universities. They are each put in charge of an appointive board of

trustees or regents, whose sole accountability is to conscience and public opinion. The state universities look principally to public taxation and state endowment for their support, though they have been the recipients of large private benefactions already, such as will doubtless be the case in the future also, while the privately endowed universities look principally to private gifts for endowment, though some of them have in the past received notable assistance from the state, as they will no doubt in the future. The staff of instruction in neither case can by any proper construction be regarded as government officials, though they occupy public positions of importance. They have no term of office, and the entire management, so far as the staff is concerned and so far as the public is concerned, is of the same character in state universities as in others. Their real function and relation to the public depends very little upon the fact of state support.

The practical workings of state support I will consider later. There are possibly one hundred state colleges and universities listed by the United States Commissioner of Education, situated, in general, in the Middle and Western States. The private endowment of institutions of higher learning is a process which necessarily waits on the accumulation of wealth and capital in the hands of private individuals. It takes time and a settled community of life to furnish conditions favorable for a stream of benefactions such as flows year by year into the treasury of Yale and other large privately endowed institutions in the older parts of our land.

In the rapid unfolding of community life in the newer states it was unavoidable that the people should find it imperative to accomplish by direct legislation many things that could not wait the slow development that had occurred in states settled more gradually. The rapid increase of population by the influx of immigration produced a state of affairs that required vigorous and prompt action in order to preserve our heritage of free institutions by the education of intelligent and able American citizens. In the attempt to meet the necessities of the case state universities were founded, many of them so-called "land grant colleges." This public provision for higher education by taxation in the newer states has been felt to be a great burden, and the public has been by no means a unit as to the propriety of the public support of higher education by public taxation. It is still regarded as an unjust tax by a large proportion of those on whom it falls, who regard higher education as a luxury which should be paid for by the very small number in any community desiring to enjoy its benefits.

For this reason and by reason of the relative poverty of the newer states the financial provision for the support of state universities has not been so ample as would be desirable, though in many cases it should be regarded as liberal when we consider the means at the disposal of these states, with their comparatively meager resources and the many calls for public money in these growing communities.

In order to make clear how the income and equipment of these universities suffer from this and other causes, I may report figures from the report of the United States Commissioner of Education for 1903 (the latest I happen to

have at my disposal at this moment). While other years would change the proportions to some extent, I am convinced that the figures for 1903 give no unfair basis for a just comparison.

A group of six of the largest privately endowed universities, consisting of Chicago, Columbia, Cornell, Harvard, Pennsylvania, and Yale, had an average income of \$1,000,000, while a second group of six of the largest State universities, consisting of California, Michigan, Minnesota, Nebraska, Ohio, and Wisconsin, had an average income of \$560,000 each. The average attendance was between 1,900 and 2,000 in both groups. The first group had an average faculty of 213, against 150 in the other group, and had three times as much invested in each of the essential items of apparatus, buildings, and books. This startling disparity may be in part accounted for by the relative newness of many of the latter group, but two at least of the first group are young universities, and it is evident that this accounts for but a very small part of the difference.

It cannot for a moment be held to be the fact that the universities in the first group have more income or equipment than they really need. Far from that: they need much more than they have. What, then, must be the state of affairs in the other group! It may be easy for an expert in the financial management of universities to picture to himself some of the killing economies in force even in this group of six of the more opulent of the state universities, but think of the condition of the more than ten times as many lesser state institutions! I will not attempt to sketch in detail the effect of the paucity of funds and facilities at the disposal of the managers of state universities, but it goes without saying that of the various items of expense in these institutions the salaries of the professors will be the first to suffer, and suffer most severely. The rural member of the state legislature, unaccustomed to city salaries, thinks that the \$1,200 or \$1,500 which his pastor receives is ample for any university professor. Such ideas have their effect on the appropriations made by the legislature for the support of state universities. It is perhaps only through the power of the purse that any direct control is exerted by the legislature. The state university is to the state, on a larger scale, what the district and high school is to the district and town, for the benefit of the children of taxpayers, boys and girls alike. Its expenses are to be made as small as possible, and would be gladly shirked altogether were that possible.

It may perhaps be said that state universities are now carried on largely in spite of the people of the state, that there are a sufficient number of influential people in each legislature who are interested in the welfare of these institutions to make it so necessary for other interests to secure their support that they must be permitted to have their way, to some extent, in diverting public money to the universities, which carry on an existence, in fact, free from state control and amenable only to the public opinion of the educated classes, just as other universities do.

The situation is one that has difficulties in it such as other universities are not compelled to face. First, with regard to post-graduate work and research which seems to-day to be an absolute necessity in order to give vitality and

real substance to university teaching. It would seem impossible to get from a legislature appropriations for that purpose when it is in some real doubt as to the propriety of supporting higher education at all. Indeed, it is very difficult to graft university traditions upon these new conditions and communities.

And next, with regard to pensions for superannuated professors: the average legislator is apt to believe that he has performed his whole duty to higher education when he has offered it to all the children of the state and provided means therefor. It will be a task well-nigh impossible to convince him that the state has any obligation toward a superannuated professor, for has he not during all his working years enjoyed a salary from the state so large apparently as to furnish him and his every luxury that heart could wish, more, in fact, than he should have been paid in his easy berth (though, in fact, he has suffered penury all his life)?

Now, these very state universities, with all their shortcomings and faults, have, nevertheless, their very great advantages, not the least of which is the avidity and eagerness of the student body for the training they offer. It is something that can be hardly paralleled elsewhere. They occupy, moreover, in general the foremost educational positions in these newer states. It is very rare that any of the privately endowed universities can compete on anything like equal terms with these state institutions. The only ones of its kind that now occur to me are Chicago, Stanford, and Washington universities.

Is it not pertinent, then, to ask how it will be possible for a foundation, whose prime object is to dignify the teaching profession in the universities of the country, to refrain from honoring and to neglect entirely to include the teaching staff of all the state universities, which are by far the most important and dignified institutions of learning in at least one-half of the area of the United States?

I am sure there is no wish to penalize, as it were, the peoples of those states who have felt themselves unable to await the slow progress of private endowment, and who have in consequence attempted to turn forward the pointers on the dial face of time in order to hasten the establishment of higher education on a firm basis. The real fact is that the states which have done so much for their state universities are in need of assistance to supplement the work already done, and this they have already received to some extent from private sources for various purposes for which the state feels itself morally or pecuniarily unable to make appropriations.

The University of Minnesota, for example, has received during its short life-time, by a private gift, a Science Building, a Woman's Building, and a Hospital, not to mention lesser assistance. It now needs private endowment of its Graduate School and a pension fund, for it can hardly expect to have these adequately cared for by the state. Such assistance to the states may be rightly compared to the assistance afforded to the nation by the foundation of the incomparable Carnegie Institution for Research, which cares for interests which the general Government feels itself unable to support adequately out of funds raised by taxation.

Under these circumstances and conditions would it not be in every way in

consonance with the large views and philanthropic ideas controlling the donor of this most beneficent foundation to use it in a way to exert upon the state universities also a vitalizing and stimulating influence, such as is evidently one of the principal objects kept in view thus far by the administration of this trust, as evinced by the steps already taken in its special recognition of men of special talent, and by the definition of what in its estimation shall entitle an institution of learning to recognition as a regularly equipped college?

Would it not, I ask, be one step further along the path already so well marked out by the administration, both natural, desirable, and logically inevitable for your board to define what, in the way of facilities for graduate work, including libraries, apparatus, fellowships, equipment for research and provision for advanced instruction, and amount of work in progress, an institution should have to entitle it to recognition by your board as a full-fledged university? Should you do this and make provision regularly for some more ample recognition for those retiring professors whose work has been specially useful in the more advanced work, you would, it seems to me, be in a position to exert an influence of telling effect, and one greatly to be desired, upon those state universities that would otherwise lag in their higher work, provided they were eligible to such recognition. It would affect them in the same manner as your present definition will affect laggard colleges.

An example of the stimulating effect of outside assistance has been well seen in the fostering influence of the national appropriations made to the states by the Morrill bill and by the Hatch bill, which have been the occasion of large appropriations to educational purposes by the states themselves.

To summarize these somewhat discursive remarks in a single concluding statement, I would say that our state universities are not an arm of government service as are those in Europe, and their teaching staff cannot, in the present state of public opinion, divided as it is upon the propriety of supporting state universities by public taxation, expect any provision for retiring pensions from the state. They are governed practically in the same way as are our other universities. They have, perhaps, about as much connection with the state control as Yale and Princeton have with denominational control. Their aims and needs do not differ from those of Cornell or Stanford or other of the younger universities. They have, however, as a class, certain peculiar disabilities as well as advantages. They are, if possible, more in need of the assistance of your fund than others, and the public may well profit more by your influence on them than on others. They are not yet so firmly fixed by tradition. They peculiarly need the influence you may exert, and apparently will be peculiarly susceptible to it. The state legislatures, in default of influence from without such as you may well exert, find themselves stopped from giving support to really advanced work.

It cannot but be regarded in the light of a great calamity if your board shall feel itself compelled to refrain from entering into relations with so large and important a fraction of the highest educational institutions in so large a section of our country, a fraction, too, whose importance must of necessity increase with great rapidity, as the statistics of growth in recent years testify.

And, lastly, in case they are not included by you, you thereby draw a line tending to render the teaching service distinctly less desirable and introduce a motive for the ablest men to withdraw from their faculties, a consummation which, under the circumstances, would be greatly deplored by every lover of sound learning, and you at the same time impose a penalty which these universities will be likely to suffer the effects of in a way to materially affect their future.

Yours very respectfully,

HENRY T. EDDY,
Dean of the Graduate School, University of Minnesota.

IV

MEMORANDUM CONCERNING THE ADMISSION OF STATE INSTITUTIONS TO THE BENEFITS OF THE CARNEGIE FOUNDATION

BY HENRY S. PRITCHETT

Under the instructions of the executive committee I forwarded to each member of this board, some three weeks before the annual meeting, printed papers presented by the representatives of the National Association of State Universities and others, setting forth in detail arguments in favor of the inclusion of state institutions among those which are to share in the system of retiring allowances established by Mr. Andrew Carnegie, through this board.

The first of these papers is a memorandum prepared by the officers of the National Association of State Universities and signed by them. Institutions are eligible to membership in this Association upon either of two grounds:

1. If founded wholly or in part upon those grants of land made by Congress to the states upon their admission to the Union.

2. If designated and recognized by a state as a state university.

The following universities are members of the Association:

Alabama	Arizona	Arkansas
California	Colorado	Cornell Univ.
Georgia	Idaho	Iowa
Illinois	Indiana	Kansas
Kentucky	Louisiana	Maine
Mississippi	Missouri	Montana
Nebraska	New Mexico	N. Carolina
N. Dakota	Ohio State (Columbus)	Ohio (Athens)
Miami (Ohio)	Oklahoma	Oregon
S. Dakota	Tennessee	Texas
Utah	Univ. of Vermont	Virginia
Washington	W. Virginia	Wisconsin
Wyoming		

Of these institutions Cornell University and the University of Vermont are not state institutions in the sense of state support or control, but are admitted to membership on the ground of eligibility first mentioned.

The second paper is one presented by President Maurice Hutton of the University of Toronto.

The third paper is one prepared by Professor Henry T. Eddy, Dean of

the Graduate School of the University of Minnesota, and contains an enlargement and amplification of the statements made by the officers of the National Association of State Universities. In all of these papers arguments are brought forward in support of the request that institutions founded and controlled by the state should be included in the list of those admitted to share in the retiring allowance system now being established by this board under the gift of Mr. Andrew Carnegie.

No one familiar with American education can regard this question as other than an important one, both from the standpoint of education and of the public interest. In a large part of the United States, and particularly in the central West, the state institutions are among the most active centers of higher educational work, and of practical technical instruction. Their incomes and their facilities are being rapidly increased, and there is every prospect that their values as educational centers will grow, not only absolutely but relatively. They form already a most important part of the system of higher education, and the omission of the professors in these institutions from the list of those who are to share in any general system of retiring allowances should be decided upon only after careful consideration. It was for this reason that the executive committee felt that every opportunity should be given to the representatives of such institutions to present their case and to reinforce it by the presence at this meeting of the representatives of state institutions themselves.

In order that the matter may be clearly before us, it will be necessary to review the governmental policies of the United States and of Canada with respect to higher education.

GOVERNMENTAL CONTROL AND SUPPORT OF HIGHER EDUCATION IN THE UNITED STATES

To-day, in the United States, two radically different plans for the support and conduct of higher institutions of learning are in process of development; the one that of the university supported from private gifts, the other that of the university supported and controlled by the state. The first finds its notable examples mainly among the older universities of the East, the second in the universities of the Central and Western States. These two systems of universities rest upon fundamentally different views as to the support of higher education. The one assumes that this support will come by the free gift of citizens of the commonwealth, the other assumes that the support of higher, no less than that of elementary, education is the duty of the state. The one system appeals to the generosity of the individual citizen, the other appeals to the sense of responsibility and the patriotism of the whole mass of citizens. The one establishes a set of higher institutions which may or may not be in harmony with the elementary schools of the state; the other establishes a set of institutions which are intended to be an integral part of that system, and its crown. The one furnishes a system of instruction in which tuition fees are high and tending constantly to grow higher, the other furnishes a system of instruction practically free. The one had its origin in distinctions essentially aristocratic, whatever

may be its present form of development, the other is essentially democratic both in its inception and in its growth. The origin of this dual effort to support and control higher education is to be found in the underlying social, religious, and political influences which have affected the growth of this nation.

The older colonial colleges—Harvard, William and Mary, Yale, Princeton, Columbia—were private corporations, but in nearly every instance they received assistance from the colonies in which they were situated. Harvard was established by an Act of the General Court of Massachusetts, Princeton was the college of New Jersey, Brown the college of Rhode Island. The furnishing of aid to colleges very naturally bred the conviction in many minds that the colleges should be under some sort of state control. In the effort to accomplish this end several of the older colleges—for example, Columbia, the University of Pennsylvania, and Dartmouth—became for a brief period state institutions. In the end, however, the effort to make of them state institutions failed. The failure was due partly to the strength of the denominational control under which most of the older colleges grew up, and partly to the reluctance of trustees to trust the fortunes of institutions of learning to the inconveniences and the supposed dangers of legislative rule. The controversy had, however, a marked effect in the newer Southern and Western States. In the rising tide of democracy which followed the formation of the Union these states provided specifically in their constitutions for universities controlled by the state. These legislative enactments had for their object the provision by law of a general system of education ascending in regular gradation from township school to state university, under the control of the state and open to all without payment of fee. It was the answer of the democracy to the victory of denominational and private control in the colleges of New England, New York, New Jersey, and Pennsylvania.

✓ Although the state university had its legal birth in the South (North Carolina, 1789; South Carolina, 1801) it found its quickest and, until the present, its greatest success in the new Central and Western States. The University of Michigan, founded in 1837, was the first to receive generous support and to grow into a strong and vigorous institution. Wisconsin, California, Illinois, Minnesota, and other states have followed rapidly. In these and many other states the state university receives a generous and growing support; it has become independent of politics, and most important of all is the organic head of a rational democratic system of education wholly free of denominational control.

No one interested in education can repress a thrill of exultation as he looks forward to the future of these great state universities. They were started at a fortunate intellectual epoch. Their foundation stones were laid when the battle for scientific freedom and scientific teaching had just been won. They were dedicated by the pioneers who founded them in a spirit of intellectual and political freedom. They are essentially and in the broadest and simplest way democratic, and the logical outgrowth of a democratic system of public schools. It is to this real democracy, to the fact that they were founded, not by a few men, nor by a single man, but by the whole people of a state, that they owe their

greatest fortune, and no one looking into the future can doubt that they are to be among the most influential, the richest, the most democratic universities of our land, vying with the oldest and most famous institutions of our Eastern states in a rivalry which we may well hope to see the noble rivalry of the scholar rather than a rivalry of riches, of buildings, and of numbers.

The essential distinction between these two classes of universities is not as between public and private universities, but as between tax-supported and non-tax-supported institutions. Harvard, Columbia, Yale, and Princeton are quite as much public institutions as are the Universities of Michigan, Wisconsin, Illinois, and Missouri. The first group is not controlled by the state and not supported by taxation; the second group is controlled by the state and supported by taxation.

There are to-day thirty-nine state universities, three of which are in the state of Ohio. This reckoning includes the university of the newly admitted state of Oklahoma, the universities of the territories of New Mexico and of Arizona, and the newly established University of Florida.

It is essential to a clear understanding of what is involved in the request of the Association of State Universities that the trustees should have before them an adequate statement of the circumstances of these institutions. The table which follows has been prepared with much care from information procured in the main from the universities themselves, and presents in condensed form such information as will give a fair idea at least of the questions involved in the admission of state universities to the benefits of this Foundation. (See Table I.)

The data contained in this table require some explanation. In the first column is a complete list of the state universities, followed in the second column by a list giving the date of the founding of each institution. In the next column we have the number in the faculty of each university for the current year. The figures for this list were furnished by the universities themselves, and not taken from the catalogues; included in each estimate are professors, associate professors, assistant professors—those who give their entire time through the academic year to teaching, or those who make their main work that of a teacher. Professors in the professional departments, such as of law and of medicine, whose principal work is other than that of a teacher, are not included. The figures given in the column, therefore, indicate as closely as possible the number of teachers who would come under the eligibility rules of the Carnegie Foundation, should these institutions be admitted to its benefits. Under the head of "Number in Instructing Staff" are included, beside teachers of the rank of professor, associate professor, etc., the instructors, lecturers, demonstrators—all who give instruction in the institution.

In the next two columns the registration at the universities is indicated. Under "College Students" is given for each university the number of students who, upon admission, were required to offer at least two-thirds of the requirements for admission as indicated for that institution in the last column of the table. By this method students of fine arts and normal students are usually excluded

TABLE I.—STATE UNIVERSITIES IN THE ORDER OF THEIR FOUNDING

UNIVERSITY	Date of Founding	No. in Faculty	No. in Instructing Staff	Student Registration	Annual Tuition		Annual Receipts		Approx. Total Gifts from State & Gen'l Gov't Since Founding	Approx. Total Gifts from Private Citizens Since Founding	Academics in Units Standard
					For Resi- dents of State	For Non- residents of State	1896	1906			
Georgia.....	1785	23	35	157	None	50.00	27,614	82,642	240,000	142,500	11.
North Carolina.....	1789	36	74	482	30.00	30.00	25,000	235,603	705,000	705,273	11.6
Tennessee.....	1794	27	105	283	86.00	86.00	61,410	88,390	1,877,250	43,896	10.
South Carolina.....	1801	19	28	151	58.00	58.00	25,000	41,730	2,556,000	None	5.2
Ohio (Athens).....	1804	22	49	389	15.00	15.00	27,670	135,198	600,000	31,000	12.
Indiana.....	1820	49	109	1684	None	None	114,584	232,138	2,500,000	100,000	15.
Miami.....	1824	36	43	261	15.00	15.00	18,341	97,472	1,038,400	50,000	14.
Virginia.....	1825	35	80	....	40.00	115.00	70,861	111,094	1,710,000	1,627,195	8.4
Alabama.....	1831	17	43	249	27.00	87.00	29,625	56,053	No record	....	10.
Michigan.....	1837	113	332	3772	30.00	40.00	227,707	451,697	6,407,003	817,851	14.
Missouri.....	1840	85	179	1541	5.00	5.00	127,709	366,111	3,211,797	294,000	15.
Iowa.....	1847	53	150	1341	20.00	20.00	101,554	432,304	3,525,666	53,750	15.
Mississippi.....	1848	17	27	903	2.50	2.50	32,643	144,704	2,124,000	40,000	11.
Wisconsin.....	1848	119	317	2443	20.00	50.00	314,436	804,521	6,603,860	90,941	14.
Utah.....	1850	30	92	203	10.00	10.00	55,152	139,007	1,691,000	65,000	10.7
Louisiana.....	1860	27	38	311	None	60.00	36,525	65,214	1,252,245	43,308	9.5
Washington.....	1861	43	79	709	None	20.00	70,000	149,345	2,892,840	500,000	15.
Kansas.....	1864	88	104	1348	10.00	20.00	104,715	391,778	3,171,812	400,000	15.
Maine.....	1867	28	64	540	60.00	70.00	29,900	41,900	581,718	155,000	13.5
West Virginia.....	1867	36	66	299	12.00	62.00	27,248	188,660	1,159,221*	75,000	12.5
California.....	1868	116	403	3897	None	20.00	325,495	727,536	Data not available	....	15.
Illinois.....	1868	156	408	2792	24.00	24.00	144,455	825,107	6,443,752	25,000	14.
Minnesota.....	1868	90	377	2929	20.00	40.00	199,221	345,261	5,359,208	191,000	15.
Nebraska.....	1869	84	190	2122	6.00	26.00	70,655	357,060	3,805,149	70,717	14.
Ohio State (Columbus).....	1870	92	151	....	18.00	18.00	112,784	628,000	4,881,063	281,285	14.
Arkansas.....	1872	36	64	381	None	None	120,400	143,900	1,760,000	None	10.
Oregon.....	1876	19	79	369	15.00	15.00	37,200	117,200	890,824	50,000	15.
Colorado.....	1877	31	115	700	5.50	10.00	86,500	140,000	1,727,125	55,000	15.
South Dakota.....	1882	24	44	180	8.00	8.00	20,000	68,750	No record	....	15.
North Dakota.....	1883	18	50	189	8.00	8.00	12,500	177,250	1,000,000	70,000	13.
Texas.....	1883	43	119	1385	10.00	10.00	123,413	289,193	3,792,307	150,000	11.4
Nevada.....	1886	23	27	143	None	None	97,250	130,000	429,839	85,000	12.
Wyoming.....	1886	18	26	118	2.50	2.50	2,933	26,081	510,844	1,100	14.
Idaho.....	1889	16	45	231	None	?	45,616	96,537	567,215	75,000	15.
Arizona.....	1891	13	24	47	None	20.00	10,500	32,200	245,000	10,000	15.
New Mexico.....	1891	8	19	28	6.00	40.00	11,500	29,615	272,021	14,182	15.
Oklahoma.....	1892	19	29	203	None	None	Rec. des. by fire	85,000	....	....	15.
Montana.....	1895	15	23	142	10.00	10.00	22,000	57,000	368,710	None	14.
Florida.....	1904	14	14	70	10.00	30.00	....	57,710	170,000	40,000	9.9

* Since 1893

from college rank; and summer session students and students of the shorter courses are always excluded. It happens, also, in a few cases that students of law and of medicine are excluded from this list. For example, the requirements for admission to the College of Law of the University of Georgia are equivalent to 3 units, and since the requirements for admission to the College of Liberal Arts of that institution are 11 units, the students of the College of Law are not counted as of college rank. In many of the universities the colleges of law and of medicine barely meet the two-thirds requirement; in the South, generally, little or no academic work is required for admission to these colleges. On the other hand, more than a high-school course is required for admission to the professional colleges of some of the universities. To be admitted to the College of Medicine of the University of Minnesota the candidate must have completed his Freshman college work; and two years of college work are required for admission to the College of Medicine at the University of Michigan. It is evident that the standard of ranking as used in the table varies with the entrance requirements of the different institutions. For instance, students listed as "college students" at the University of South Carolina, where the maximum requirements for admission are 5.2 units, would not be so listed at the University of California where the standard is 15 units. The figures under "Total Enrollment" give the entire student registration, including in most cases the attendance of the summer session.

The two columns under "Tuition" indicate the amount of tuition required of regular students, a difference being indicated in many instances for the residents and non-residents of the respective states of the universities. In these lists no account is taken of free scholarships, free tuition to students preparing for the ministry, for the profession of teaching, etc.

The next two columns of the table present a comparison between the annual income of these institutions in 1896 and in 1906, omitting in all cases receipts from tuition. This income is made up from four sources. First, the income from the mill tax. This item is the largest in the case of those states which have voted the mill tax for the support of their universities, as is the case in the states of Michigan, Iowa, Wisconsin, California, Minnesota, Nebraska, Colorado, North Dakota, and Wyoming. The income of the University of Colorado for the year 1906 is derived wholly from this source. The second source of income is that of direct appropriation from the state, which is the main dependence of the greater number of institutions. The third source of income is from endowments, derived in nearly all cases from the sale of public lands. The fourth source of income is that from private gift. This source of income is small except in the case of a limited number of institutions, generally those in the South. The next two columns contain the best approximation that could be obtained showing the total support received by each university from governmental sources since its foundation, in comparison with the total support received from the gifts of private citizens. The last column contains the number of units which under the system adopted by the trustees of the Carnegie Foundation express the requirements for admission to the university. These units will be explained in detail later.

The table shows in the aggregate that the 39 universities employ 4,221 teachers of all grades, of whom 1,738 are professors in the faculties and would, if these institutions are admitted, be eligible for retiring allowances. The table shows also a catalogue registration of students amounting in the aggregate to 51,651, of whom 30,693, or about 59 per cent, are classed under the criterion given above as college students. The total annual support of these institutions (omitting tuition fees) was, in 1896, \$2,910,216 and, in 1906, \$8,579,361, while the total government aid afforded them since their foundation is \$76,070,868, the support from individual donors during the same time being \$6,351,998.

A most striking feature of the table is the evidence which it presents of the generous growth in support of state institutions during the last decade, particularly in the cases of the great universities of the Middle West. The table which follows shows how rapidly the incomes of these institutions have increased. They include only the income from governmental sources, national and state.

GROWTH IN GOVERNMENTAL SUPPORT—WESTERN UNIVERSITIES

<i>University.</i>	<i>Annual Income in 1896.</i>	<i>Annual Income in 1906.</i>
Michigan	\$225,200	\$438,500
Missouri	127,700	366,100
Iowa	101,600	429,600
Wisconsin	313,000	796,400
Kansas	104,000	301,800
California	316,800	677,800
Illinois	144,500	825,100
Minnesota	199,200	345,300
Nebraska	70,700	357,100
Colorado	86,500	140,000
	\$1,689,200	\$4,577,700

The state university originated in the South, but there were many reasons why it has not heretofore flourished there as in the West. In the period before the war social and political conditions in the Southern States were not favorable to the growth of a system of public schools, crowned by a state university. Following the close of the war came the dark epoch of reconstruction from which the Southern States emerged with enormous state debts whose burden they still feel. The old Commonwealth of Virginia has a state debt nearly two and a half times that of the rich and populous state of New York.

In addition, the state university has met in the South a competition from the denominational college far more sharp than that which the state university of the Central West has encountered. Throughout the entire region south of the Mason and Dixon line education has been almost entirely under denominational influence, and there has always existed a sentiment, if not hostile to,

at least critical of an educational organization which was frankly independent of denominational affiliation. Nevertheless during the last two decades state universities in the South have made great strides both in material resources and in the estimation of the citizens of their states. Their faculties are being rapidly improved, and they are fast becoming, as in the West, the centers of educational influence. They still fall behind the universities of the West in articulating with the general educational system of their states. In all these respects, however, the state universities of the South are making rapid progress, and another decade will show throughout the Southern States a series of state universities strong, well equipped, and crowning the educational system of their respective states, and this last is the true function of the state university. The growth in income of some of the southern universities is shown in the table which follows:

<i>University.</i>	<i>Gov'tal Support 1896.</i>	<i>Gov'tal Support 1906.</i>
Georgia	\$27,600	\$78,100
North Carolina	25,000	106,000
South Carolina	25,000	41,700
Virginia	50,000	58,300
Mississippi	32,640	143,700
Arkansas	120,400	143,900
Texas	123,400	289,193
	\$404,040	\$860,893

In certain of these states the growth of the appropriation by the state is most encouraging. Thus in 1896 the University of Georgia received nothing in the way of direct appropriation from the state. In the year 1906 it received \$80,000. The University of North Carolina received \$25,000 from the state in 1896 and \$95,000 in 1906. The University of South Carolina received \$25,000 in 1896 and \$41,730 in 1906; while Mississippi appropriated something over \$32,000 in 1896 and \$100,000 in 1906. The state appropriation to the University of Texas has grown from \$63,500 in 1896 to \$130,250 in 1906. This great state with imperial resources still leaves its university to be supported in the main from the income of an endowment provided many years ago by the sale of public lands.

These exhibits from western state universities and from southern ones as well are indicative of a rapidly growing generosity in the support and maintenance of state institutions.

The next two columns of the table throw light upon another matter of interest and one closely related to the question which we are seeking to answer. They exhibit a comparison between the gross sum provided from governmental sources, and in the main by the state, since the founding of each university as compared with the gross support from private citizens during the same epoch. An inspection of this table brings out clearly, as it seems to me, the fact that

the fundamental policies which have resulted in generous support of state institutions have been these two:

1. That the institution should maintain fair standards and make itself the head of the state system of public instruction.

2. That it should appeal frankly and unreservedly to the state for support as a free state institution.

Two clearly marked policies present themselves to educational institutions in this country.

1. The career of a university supported by taxation, in which case the institution should become a creature of the state, governed by it as part of its educational system, and frankly depending upon it for support. This policy is clear-cut, consistent, and defensible.

2. The career of the university which undertakes to furnish higher education through the aid of private philanthropy and with the assistance of the alumni and friends who may be interested in the institution itself. Such an institution does not accept control from the state and does not solicit support from it. This policy is also consistent and defensible.

All institutions in this country which have succeeded in securing generous support have proceeded upon one or the other of these lines of policy, and the figures of the table which are here presented emphasize the fact that the state university which has attempted to combine the policy of public service with the policy of appeals for private support has fallen between the two. The state universities which have become strong have secured their support almost entirely from the state and in consequence of their relation to the state as a part of its educational system. This fact is clearly illustrated in the table which follows and which exhibits in the case of leading institutions the proportion of assistance which they have had from state government and from private citizens.

<i>University.</i>	<i>Date of Foundation.</i>	<i>Received from State and General Gov't Since Foundation.</i>	<i>Received from Private Citizens Since Foundation.</i>
Michigan	1837	\$6,407,000	\$817,850
Missouri	1840	3,212,000	294,000
Iowa	1847	3,526,000	52,750
Wisconsin	1848	6,604,000	90,900
Kansas	1864	3,172,000	400,000
Illinois	1868	6,444,000	25,000
Minnesota	1868	5,359,000	191,000
Nebraska	1869	3,805,000	70,700
		\$38,529,000	\$1,942,200

Briefly speaking, these eight institutions which represent the strong state universities of the Central West have received somewhat less than five per cent. of their total support since their foundation from private sources, and this support has come in the main to a few institutions. Wisconsin and Illinois,

which together have received from public sources some \$13,000,000, have received from private citizens the insignificant sum of \$116,000. This is in sharp contrast to some of the universities of the South which have depended quite as much upon private support as upon state aid; thus the University of North Carolina has received since its foundation approximately \$705,000 from Government sources, while it has received \$705,273 from private gift. The University of Virginia has received since its founding in 1825 \$1,710,000 from the state, while during the same period it has received \$1,627,000 from the gift of private citizens.

The last column in the table gives the number of units which under the system adopted by the trustees of the Carnegie Foundation for the Advancement of Teaching corresponds to the standard of admission adopted by the various universities. In the first annual report of the President of the Carnegie Foundation a detailed explanation of these units is given. Briefly their meaning is as follows:

Under the rules adopted by the trustees which follow closely the law of the State of New York, an institution to be ranked as a college

“should require for admission not less than the usual four years of academic or high-school preparation or its equivalent, in addition to the pre-academic or grammar-school studies.”

In attempting to estimate what constitutes the four years of academic preparation the trustees have followed the plan generally in use among colleges and preparatory schools in estimating entrance requirements, that is to say, they have expressed the equivalent of a high-school course in units. Most high schools pursue a given subject for either a half year or for a whole year, recitations being had thereon five times a week. Such a course in one study for one year is adopted as a unit. Fourteen such units are accepted as the equivalent of the “usual four years of academic or high-school preparation.”

It is necessary, however, to estimate these units not only on the basis of the time required but quantitatively also, since many institutions express their requirements in this way. For example, algebra to quadratic equations, or plane geometry, or six books of Virgil express requirements as defined by many institutions. As a rule, these two systems of estimation are in agreement. Thus an institution which requires elementary algebra will count this, generally, as one unit, which is exactly the value which elementary algebra ordinarily has when estimated on the basis of the time given to its study.

There are however at times discrepancies between these two methods of estimation, particularly in the cases of universities and colleges where students are admitted on certificates from schools in which the courses involve a smaller number of recitations than five times a week. In this matter there is considerable variation of practice among the state universities. In some cases the catalogue requires that the studies shall have been pursued “four or five” times a week. Ohio University at Athens maintains a three-year preparatory school in which, however, the student takes up in three years all of the studies ordinarily pursued in the high-school course of four years. These differences

illustrate the difficulty of estimating the number of units in the adopted scale in the cases of state universities. The numbers which are given in this column are however the best estimates which can be made from all the data available and, while they are not absolute, they present a very close approximation on a uniform scale to the standards actually adopted by the different institutions, and the figures furnish a fair means of comparison between the standards of different state universities and a comparison as well with the standards of private institutions.

An inspection of these figures brings out at once the fact that a little more than half of these institutions would be eligible at present to admission to the benefits of the Carnegie Foundation on the ground of educational standard. The wide variation in standards of admission existing between these state institutions, all seeking to do work of a similar character, is indeed striking.

Another fact immediately evident from this inspection is that the admission of state universities would not extend the list of "accepted institutions" to sections of the country now unrepresented. In the whole region south of Mason and Dixon's line there are only three state universities whose requirements for admission are equal to those adopted by the trustees of the Foundation, requirements quite moderate in their standards and such as have been approved by teachers in colleges and preparatory schools as alike fair to the college and to the school. These are the universities of the new state of Oklahoma, and of the territories of Arizona and of New Mexico.

The figures which are here given are significant not only in affording a comparison between the standard of admission adopted by the trustees and that adopted by these universities, but they are more significant still as showing the relation of the universities themselves to the educational system of their various states. In certain cases the university is articulated with the public school system, that system being based upon a three-year high-school course; but in a great number of cases the university has not made itself the head of the public school system, but is competing with the high school for students. Nearly all the Western state universities have gone through this stage of evolution, and none of them has succeeded which has not ultimately adopted a fair standard of admission and made itself thereby the head of its school system. The history of the University of Missouri during the last fifteen years is a notable example of this sort of progress. Fifteen years ago this institution was a weak combination of the college and the high school, with meager support from the state. Fortunately there was called to the presidency a man who had the wisdom to stop competition with the high schools, raise standards and appeal frankly to the state upon the ground of a higher class of work and better ideals of education. In bringing up the standards of the university he has brought up the entire school system of the state as well, and the result has been not only academic strength and vigor for the university, but a generous recognition and support by the state, and a cordial coöperation on the part of the public schools.

From time to time I have received letters from southern colleges and uni-

versities insisting that the officers of the Foundation have, by adopting fourteen units, placed their standard too high; that this standard is working hardship among institutions in the South. I appreciate keenly the significance of the last statement. The southern institutions, in attempting to raise their requirements for admission during the last half dozen years, have met with opposition and difficulty; the long established traditions give way slowly; and a standard of fourteen units which is actually to be enforced seems to many of them a condition possible only in a very distant future. But progress for a higher standard is steadily being made, and this progress, I believe, is one of the most important movements in southern education at the present time. An examination of recent catalogues of the state universities of the South shows an advance from about four or five units to ten or eleven. Without exception the requirements for admission are being increased among these universities, and in a few instances new requirements are announced as far ahead as for the year 1909-10. Judging from the work now being done, and from the spirit of the men doing the work, I feel sure that as high a standard will exist among the state universities in the South as in any other part of the country, and to this end I trust that the fourteen units will prove to be a help and not a hardship.

Sixteen of the state universities were the recipients of the land-grant bounty flowing from the Morrill Act of 1862 and subsequent Acts. These are the universities in the following states and territories: Arizona, Arkansas, California, Georgia, Idaho, Illinois, Louisiana, Maine, Minnesota, Missouri, Nebraska, Nevada, Ohio, Tennessee, Wisconsin, and Wyoming.

In consequence of the receipt of this land-grant aid there is incorporated in the organization of each of these universities a college of agriculture and mechanic arts, established under the provisions of that grant.

I endeavored to present the data with respect to these sixteen colleges of agriculture separately from the data of the universities with which they are connected, but found the effort difficult to accomplish. In many cases the professors in other departments of the university also do work in the school of agriculture, and for various reasons it seemed impossible to make an exhibit of the work of the schools of agriculture apart from the work of the universities.

The presence of departments whose standards differ from those of the ordinary academic work as widely as do those of most of the agricultural colleges constitutes an unusual feature of the work of those universities which include in their organization the land-grant college. In some of these universities the requirements for admission to the college of agriculture are the same as for admission to other departments of the university. In most of them, however, a more elementary form of work is offered in which the requirements are practically those of the elementary school, and this work is by far the more important which the school of agriculture undertakes, at least in amount. For example, in the University of Wisconsin (catalogue 1904-1905) 80 students were taking the long course in agriculture, while 439 were taking the short course and the dairy course. In that same year the total registration of students was placed at 3,842, but of this total 710 (about one-fifth of the whole)

were in the course of agriculture and dairying, for whom the only conditions of admission were that they should be 16 years of age and have a common-school education. In other words, a large mass of students were here introduced into the university under entirely different conditions of admission from the ordinary academic conditions in force in other departments. Without doubt this arrangement is a wise one so far as the work of agricultural instruction is concerned, and the service of the college of agriculture to the state would be very meager if it limited its opportunities to those who complied with the college entrance requirements. The matter is, however, mentioned simply to show one of the difficulties of dealing with institutions which include in their organization such a wide range of academic conditions on the part of an agency whose trust is intended specifically for the promotion of higher education, and to emphasize the fact that, in proportion as the state university has become an effective agent of the state, the obligation of the state for its support in all directions becomes more clear and more direct.

In view of the weight laid upon the influence of the Morrill Act in the arguments which have been put before you, it may not be out of place to make some reference to the effect of this legislation upon the development of higher education. The legislation which resulted in the Morrill Act of 1862 was had in the midst of the Civil War, and was coincident with the general movement looking toward the new scientific and industrial education. The devotion of this generous portion of the public domain to the uses of education was the greatest single gift ever made by a nation to the cause of education.

No one can question that this action on the part of the Congress of the United States has had an immense influence in stimulating the development of educational activity in many states. At the same time it is too early to estimate fully its final effect upon higher education, and valuable as its results may have been in some directions, they were not without ill effects in others.

In states where the Morrill grant went to the university, it has seemed in certain cases to have quickened the action of the state and to have called out larger public support. In other cases it has seemed to work in the opposite direction, and various states have shown a disposition to leave to the general Government the sustenance of their university and agricultural colleges. The state of Tennessee, for instance, makes no appropriation for its university, and its sole support outside of tuitions is received from the endowment resulting from the sale of public lands.

In other states where the Land Grant Act resulted in the establishment of a new institution, the results were by no means always the same. More than one of the state universities suffered a long period of delay in its development on account of the inauguration of a new state institution—the land-grant college—an institution which has grown to be a rival of the state university. It is one of the anomalies of this generous outpouring of public funds that in more than one case the same state now supports rival engineering schools, one at the land-grant college, the other in the university.

The most serious result, however, growing out of the rivalry which the founding of the new colleges brought about was the political competition with

respect to educational matters in the state legislature. The politicians in that part of the state in which the land-grant college was situated were inclined to play their school against the state university in the matter of appropriation, and with good success. The situation was rendered still more difficult in certain states where a third state institution was created by the establishment of a mining college or other technical school, so that in the state legislature there were three rival influences, each competing for recognition and with the tendency to make the question of just support of higher education a question of local politics rather than a question of wise state policy.

Admitting all that may be claimed for the benefit of the Morrill Act, at least this may be said: its enactment furnishes no parallel to the action which is here suggested on the part of a private agency, and the results of its influences, as far as higher education is concerned, are not as yet wholly evident. Of one thing we may be sure: its influence in the development of higher education has been only one of many factors and not by any means the most powerful. The University of Wisconsin has grown strong in the possession of the state land grant, the University of Michigan has grown strong without it. Whatever may have been its effect upon the cause of higher education, its influence has not changed this fundamental fact: those state universities have grown strong and have received generous support which have upheld fair standards, which have made themselves the real heads of the state system of education, and which have appealed unequivocally to the state for their support as state institutions.

A second class of state institutions of college rank consists of what are ordinarily known as land-grant colleges together with a few technical colleges controlled and supported by individual states, such as schools of mining.

These colleges are in almost all cases colleges of agriculture and mechanic arts. Although agricultural interests have always been the most important in the United States, it was the middle of the nineteenth century before any serious attempt was made to establish institutions for agricultural instruction. The first attempt to do so was in connection with the older institutions, such as Columbia and Yale, but these efforts came to little in the way of practical results. Previous to this time the general government had interested itself in the free distribution of seeds. Farmers were urging in many parts of the country, by 1860, the establishment of schools for agricultural instruction. As early as 1838 a petition was presented before the Legislature of New York urging the establishment of such a school, but many years elapsed before any state enacted legislation providing for such an institution. The first to be established was the Michigan State Agricultural College, founded at Lansing in 1857. Maryland was the next state to found an agricultural college, in 1859. In Massachusetts the charter for a similar institution was granted in 1856, but actual instruction was not begun until 1869. In Pennsylvania, in 1855, was established what was called the Farmers' High School, intended to give agricultural education. In 1862 the name was changed to the Agricultural College of Pennsylvania, and in 1874 again changed to the present title of Pennsylvania State College. These four institutions may be fairly said to have antedated the activity due to the Morrill Acts.

The great number of agricultural colleges of to-day, however, owe their origin to the Morrill Act of 1862, and the four institutions which have just been mentioned became also beneficiaries of this Act. This Act provided for a grant of 30,000 acres of land for each representative and senator in Congress. This land was to be situated "in place" where the state contained a sufficient quantity of public land, subject to sale at \$1.25 an acre. When the state did not contain such land, scrip representing an equal number of acres was issued. The grant conveyed in all 9,600,000 acres, 1,770,000 of which was land in place, and 7,830,000 in the form of scrip. It was perhaps the greatest gift ever made to education, but its chief significance lay in two facts:

First—That the Congress of the United States appropriated part of the national resources to the support of educational institutions in the states.

Second—That the education which Congress had in mind to assist was the new industrial and scientific education.

When the various states received their portions of the land-grant scrip, each disposed with more or less haste of a considerable portion and proceeded to establish courses in colleges already in existence or to found new institutions. In some states land-grant funds were turned over to private institutions for a time; Rhode Island voting hers to Brown University, Connecticut to Yale, New Hampshire to Dartmouth, and New Jersey to Rutgers. In Massachusetts one-third of the land-grant aid went to the Massachusetts Institute of Technology. The final effects, therefore, of the Morrill Act and subsequent Acts of the same sort upon higher education have varied greatly in accordance with the policy pursued by a state in the distribution of these funds. In some states the money was used in the foundation of a state university which should comply with the conditions of the Morrill Act in giving instruction in agriculture and mechanic arts. Among the universities which owe their origin to this legislation are those of California, Illinois, Maryland, Minnesota, Nebraska, Nevada, Ohio, West Virginia, and Wyoming.

A certain number of states issued their funds to found purely agricultural colleges, others again divided the funds between two separate institutions, one for agricultural study located in a farming community, and another whose work was chiefly in the mechanic arts.

Other states, usually those which had a large share of the scrip, aimed to carry out the provisions of the Act by applying the proceeds to a single institution in which agricultural and mechanic arts should receive full attention, but which should be a university in a larger sense. In New York the funds were given in this way to a private institution, Cornell University; in Illinois to the State University.

The development of these colleges has been much affected by the industrial growth of the country and the strong influence in education setting toward engineering instruction. There has been a tendency among them to become engineering schools rather than schools of agriculture, and in some of them agricultural instruction forms but a small part of the total instruction offered. Among them are some of the strong, well-equipped engineering schools of the

country, others are doing a more elementary but doubtless a no less useful work. The tendency is to develop toward a school of technology with larger faculties, more ambitious curricula and higher entrance requirements. Whether this policy is a wise one and one calculated to serve the best interests of the whole people is quite aside from the present inquiry. To make these institutions eligible to the benefits of this retiring allowance system on condition that their entrance requirements are made equal to the standard of the college adopted by the trustees of this Foundation would add a strong impetus to this tendency. In the table which follows are presented certain interesting data concerning these institutions which exhibit in better detail than can be done in a brief statement a comparison of their resources and their academic standards. The table includes only such institutions as are controlled and supported by the state and does not include Cornell University, the Massachusetts Institute of Technology, the University of Vermont, and Rutgers College, which receive the whole or a part of the land grant allotted to their respective states, but which are private institutions not under the control of the state or supported by it.

An inspection of this table shows at a glance that most of these institutions, and particularly those which have followed most closely the work of agricultural instruction, are not of academic grade, and that to raise their standards to those of the college would be a serious injustice. These institutions are founded and maintained by the states for promotion of their own economic interests. Any retiring allowance system established in them ought to be based on entirely different academic standards from those of the universities and colleges.

There are in this list a very few institutions with large income and high entrance requirements, such as the Iowa State College of Agriculture and Mechanic Arts, which is essentially a high-grade engineering school. This institution divides with the State University of Iowa the fund derived from the mill tax, and its income in 1906 exceeded that of the State University. The combined income of the two institutions closely approximated that of the University of Wisconsin. Purdue University, which holds a place high among the engineering schools, has up to the present time consistently maintained requirements of admission not to exceed 6.4 units. The requirements for the fall of 1907 have been advanced, with provisional conditions, to about 15 units. The faculty at Purdue has felt that there is sufficient grounds for rating technological institutions on a somewhat different basis from colleges of liberal arts. For all applicants coming direct from the high schools to Purdue it has decided to enforce strictly the 15 units. But for a constituency of applicants who do not come direct from the high schools and who are men in years and experience, a set of examinations involving only the most essential studies in preparation for the curriculum of Purdue are administered. These examinations, which do not represent a total of 15 units, are varied in individual cases. Years and experience in practical work of a technical nature are considered the equivalent of school subjects in satisfying the requirements for admission. In the past about twenty per cent of the students have been

TABLE II.—LAND-GRANT COLLEGES IN THE ORDER OF THEIR FOUNDING

INSTITUTION	Date of Founding	No. in Faculty	No. in structuring Staff	Student Registration		Annual Receipts		Approx. Total Gifts from State & Gen'l Gov't Since Founding	Approx. Total Gifts from Private Citizens Since Founding	Academic Standard in Units
				No. Col-lege Stu-dents	Total Enroll-ment	1896	1906			
Michigan Agricultural College.....	1857	94	88	686	960	74,000	927,286	1,915,624	None	4.5
Maryland Agricultural College.....	1859	16	90	128	186	27,960	47,950	790,600	None	2.
Pennsylvania State College.....	1859	94	80	627	3249	157,151	156,305	1,593,486	54,785	10.
Kansas State Agricultural College.....	1863	32	89	872	1690	43,444	163,276	1,111,523	None	5.
State College of Kentucky.....	1866	42	47	437	813	59,019	73,471	1,438,381	None	12.
Massachusetts Agricultural College.....	1867	16	31	263	306	65,851	88,279	1,000,000	40,000	10.4
New Hampshire Col. of Agri. & Mech. Arts.....	1867	16	25	165	212	34,063	46,184	411,000	141,000	14.
Iowa State Col. of Agri. & Mech. Arts.....	1868	59	123	933	2167	105,508	447,009	Data not available	30,000	15.
Oregon Agricultural College.....	1870	19	37	510	735	25,000	60,000	60,000	None	3.
Virginia Polytechnic Institute.....	1872	31	56	590	619	33,325	82,325	1,716,795	None	3.5
Alabama Polytechnic Institute.....	1872	94	45	422	579	53,434	80,923	1,414,000	5,000	4.9
Purdue University.....	1874	50	126	1342	1523	104,000	288,456	3,008,669	437,190	15.
Agricultural & Mechanical College of Texas.....	1876	90	47	363	411	63,490	117,250	1,564,927	None	2.
Colorado Agricultural College.....	1879	23	53	169	504	.....	131,000	1,325,000	None	8.
Mississippi Agricultural & Mechanical College.....	1880	26	47	.....	824	43,312	119,564	1,427,001	None	1.
Connecticut Agricultural College.....	1881	14	21	66	170	45,060	51,810	995,637	101,000	7.5
South Dakota Agricultural College.....	1884	20	39	176	571	27,197	91,006	1,037,232	2,000	11.6
North Carolina Col. of Agri. & Mech. Arts.....	1889	11	42	313	487	35,536	57,470	837,309	33,398	1.5
Agricultural College of Utah.....	1890	29	59	114	663	.....	.....	.....	.....	6.
Rhode Island Col. of Agri. & Mech. Arts.....	1890	11	26	49	131	33,000	67,300	500,000	None	8.5
New Mexico College of Agri. & Mech. Arts.....	1891	12	31	57	217	5,900	59,400	127,250	10,000	6.
North Dakota Agricultural College.....	1891	29	42	.....	718	33,514	112,865	886,668	18,400	7.
Oklahoma Agricultural & Mechanical College.....	1891	14	18	137	906	None	145,000	297,000	2,000	2.5
State College of Washington.....	1892	32	65	363	1079	60,000	127,000	800,000	10,000	15.
Clemson Agricultural College.....	1893	38	43	533	652	71,640	180,130	2,002,646	66,192	2.9
Montana College of Agriculture & Mech. Arts.....	1893	26	32	68	270	.....	.....	.....	.....	.....

admitted under such provision and, judging from the records of these students, the faculty feels entirely justified in its action.

In order that these institutions should be brought under the provisions of the Carnegie Foundation one of two courses must be followed. Either the trustees of the Carnegie Foundation must drop all consideration of academic standards or these institutions must be invited to raise their standards of admission to those of the college. As the gift of Mr. Carnegie was distinctly a gift to higher education, the first course seems clearly out of the question. The second would seem entirely inconsistent with the present policy of these institutions and their obligations to the students of their respective states. It seems clear, therefore, that for the present at least these institutions should not be included in the provisions of the Carnegie Foundation. This would seem equally true concerning the majority of agricultural colleges conducted in connection with state or private universities.

There are also a few technical schools supported by different states which are independent both of the state university and of the land-grant college. These are generally schools of mining, and in one of two cases schools of technology. Such schools would naturally stand upon the same basis as other state institutions. In nearly all cases the academic standards of these schools are below those of the college.

Besides the state institutions, there are in the United States one or two colleges or universities controlled and in part supported by a municipality—such, for instance, is the University of Cincinnati. Such cases are unusual, and are due generally to individual initiative; they do not represent any general policy in American cities. Their cases may well be considered, as it seems to me, apart from that of general policy and upon their individual claims.

THE QUESTION OF PUBLIC POLICY

The essential question with which we are therefore concerned is with the large group of institutions included in the state universities. The significant fact to be here considered is this: Here is a series of institutions established in the separate states in pursuance of a distinct policy on the part of both national and state governments. The institutions are the property of the states and a part of their educational system.¹ The practical question which is before us at this moment is: Shall we throw open the benefits of this retiring allowance system to the 1,738 professors of these governmental universities?

This question, as it seems to me, needs to be considered from at least three points of view:

1. The standpoint of the teachers in these institutions and of the cause of higher education.
2. The standpoint of a sound public policy.
3. The standpoint of the work of the Carnegie Foundation and that which it may hope to accomplish.

¹ In one or two instances the measure of state control is small, as in the case of the University of Tennessee.

I shall endeavor to discuss the question from these three points of view.

It is clear that the teachers of state universities have, as teachers, quite as good a claim to a retiring allowance system as have any other teachers. Their work is of the same order and of the same character of devotion as that done in private universities and colleges. Alike from the consideration of the work of their teachers and from regard to the general system of education, it seems quite as desirable that the benefits of a retiring allowance should be established for teachers in state universities and colleges as for teachers in any private university or college. From the point of view of education, it is somewhat anomalous that a board of trustees representing the teachers of the whole country should extend the benefits of this retiring allowance fund to a modest private college and deny it to a great state university. There is, too, another view of the service of the state university which those connected with private institutions are likely to overlook or to forget. This is the vital connection which it represents between education and practical democratic government.

The older American colleges in the days of their weakness sought and obtained a measure of state aid. All these institutions, however, as the difficulties of political connection became evident, chose the alternative of private control and support, a form of distrust of democracy not uncommon in a republic. The state university deserves the credit of launching its barque upon this sea. It has endured the storms of political interference and the dangers of party politics and has come safely into smoother water. To-day it is the most encouraging feature of popular government which the states of our Union have to show. It is true that the state institution is indebted in large measure for this development to the example of the private independent university and college. None the less it stands to-day the best evidence we have to offer of the outcome of an enlightened appeal to the intelligence and patriotism of our various commonwealths. For this great service, not alone to education but to practical democracy, all citizens of our country owe a debt to the statesmanship of those who planned these universities, and most of all is recognition due to the army of teachers who have given their lives in them to the cause of democratic education.

When one comes, however, to consider the point of view of public policy, it seems to me clear that, while it is just as desirable that a retiring allowance system should be available for teachers in state institutions, the method in which such a system is to be provided is a question of far-reaching importance. The state institutions of the Central West have spent some forty years in establishing firmly the claims of higher education. This effort had for its object the bringing the citizens of various states to a point of view where they willingly and generously support higher education. This long struggle has been crowned with success. The great universities in Michigan, Wisconsin, Illinois, California, and in many other states are now receiving a support which ten or twenty years ago would have been considered impossible. These states are sustaining to-day and sustaining generously, not only undergraduate instruction in arts, in science, and in technology, but in graduate work and research as well. The graduates of these institutions are becoming more and

more influential in their states and in legislation. Political interference is disappearing, and the state university has assumed a position in the regard and esteem of the people of these states which makes its future secure. In a word, the principle that higher education shall be supported and maintained at public expense as a part of the system of public education has been established and the states have definitely accepted this responsibility.

Under these circumstances it seems clear that retiring allowances, when established in state institutions, should be established by the states themselves as a part of the legitimate expenses of higher education. Furthermore, it seems to me questionable whether the intervention of a private agency, even if it be national in its scope, offering to each of the forty-five states of the Union the benefits of a retiring allowance for teachers, would not greatly weaken the sense of responsibility of the states for educational support. If such a result should follow, the admission of state institutions to the benefits of this fund would be a harm, not a kindness, to the institutions themselves.

This phase of the matter has been dwelt upon in the papers which you have received from state university representatives. It has there been set forth that outside assistance to state institutions, such as that which came from the Morrill Act, has not operated to dull the state's sense of responsibility. It seems to me that such a measure as the Morrill Act is not a parallel case to that which we are considering. The assistance furnished by the general government was necessarily only a partial assistance, and it was given on the condition that the states should do their part. Such a measure might have an entirely different effect from similar action taken for all the states by a private agency. I can understand the hesitation which the heads of institutions of learning feel in approaching their state legislatures with the proposal to furnish retiring allowances for professors. This difficulty has been set forth in the papers which have been placed before you, and it has been emphasized in repeated letters which have come to me from various university presidents. Much as I sympathize with this attitude, it nevertheless seems to me no answer to the statement that retiring allowances for state institutions should be furnished by the state. In truth, the real problem of a state university is the problem of securing the confidence and the appreciation of the whole people of the state. If once this is done, all the things which may minister to a great institution shall be added unto it, including retiring allowances. It is scarcely credible that great and rich states will deny to their universities such support, once it is made a part of the usual academic compensation. These states have not yet failed to respond to any real demand of the time for higher education. Those who govern these universities may appeal with certainty to the patriotism and the intelligence of their states in this cause as in the others which have preceded it.

It is worth noting that in the arguments presented by the representatives of state institutions the difficulty of obtaining retiring allowances from the state is placed not upon the amount of money required—this is wholly insignificant in comparison with the large sums annually provided by many states—but upon the fact that the members of the various state legislatures cannot

be made to appreciate the importance and the significance of the additional security thereby given to the teacher.

This argument does not seem to me justified by the history of state institutions. As a matter of fact, the legislatures in those states in which the strongest universities are situated have not yet failed to meet any want of the state university which those in authority believed to be a vital one. Heretofore in state universities, no less than in private universities and colleges, it has been far easier to obtain money for buildings, for laboratories, for material equipment of all sorts, than to obtain means for betterment of the teacher's profession or for giving to it a greater security and dignity. In all colleges and universities, whether under private or state control, it has been easier for those in charge to economize on teachers and to ask money for material ends. The time has come in the history of American education when it is more important to dignify and to strengthen the profession of the teacher than to build many laboratories and athletic fields; when it is more vital to the state to make the place of the teacher attractive to men of the best ability, of the greatest initiative, and of the highest social standing than to have the highest enrollment of students or the largest staff of instructors. Whenever the authorities of state universities are themselves fully convinced of these facts it will not be long, in my judgment, before the legislators will begin to share their opinions.

Nor does the plea that a particular state provides grudgingly for its university form, in my judgment, any additional argument for action on the part of this board with respect to that university. The real problem of the state university is to gain the confidence and support of its state. All other questions are secondary and comparatively unimportant. No system of retiring allowances established by this Foundation could make an institution strong which is now weak by reason of half-hearted support or by reason of political entanglement.

The third standpoint from which we, as trustees, must judge this matter, is from the standpoint of the purpose and the work of the Carnegie Foundation. With the generous fund placed in our hands we are to develop, as best we may, a system of retiring allowances in the higher institutions of learning in the United States, Canada, and Newfoundland, such as may serve in the best way the interests of the general body of teachers. The gift is intended to serve specifically the cause of higher education.

Whatever differences may exist as to the best means of administering this important trust, at least this fundamental principle will be conceded: the retiring allowance, when it comes to a professor, should come to him through his university as a right, not as a favor. The retiring allowance system as a part of the regular academic compensation will strengthen and dignify the teacher's calling. The allotment of pensions as a matter of charity to needy teachers can accomplish no such result.

It is clearly, therefore, the duty of this board to proceed carefully, perhaps slowly, to select institutions in different states and provinces in accordance with the academic standards adopted and with due regard to the provisions of its charter. In the end this will result in the payment of the entire

income to a list of institutions representative, it may be hoped, of all sections. The establishment of the retiring allowance system in so large a number of representative institutions will make it a part of the American academic system. Institutions which for one reason or another cannot be admitted to the benefits of the Carnegie Foundation will provide in some other way their own retiring allowance system.

The number of institutions for which the present endowment will provide a fair system of retiring allowances it is impossible at this moment to say. In my annual report I have endeavored to make such an estimate, but the data are not yet available for a definite judgment. It is clear, however, that to add to our list of accepted institutions all state universities and colleges would be to complete practically the list of institutions for which this Foundation can provide an adequate retiring allowance system. We cannot justly at this time take such action. We shall serve a far larger purpose if we proceed slowly to admit colleges and universities to our list, taking care to give opportunity to institutions in sections not now represented to secure places upon it and, if necessary, reserving places until they can bring up their educational standards.

I have therefore come to the conclusion that with due regard to the interests of education, in deference to a sound public policy, and with due reference to the work and the purpose of this Foundation, we cannot at this time admit to the benefits of the retiring allowance system the state universities of the United States. And this conclusion, I venture to hope, is founded upon due regard for the larger interests and the future welfare of these institutions themselves. I have the sincere conviction that, looking beyond the present, this action will prove to be in the interest, not against the interest, of all these teachers.

GOVERNMENTAL CONTROL AND SUPPORT OF HIGHER EDUCATION IN CANADA

It is one of the pleasant features of the work of this board that its interests, and I hope its outlook, are not limited by sectional or even national lines. In considering this question, therefore, it is our duty to examine the matter from the standpoint of **Canadian educational interests and those of Newfoundland**, no less than from that of the interests of education in the United States. Such an inquiry is all the more interesting because of the fact that the development of the principle of higher education by the state has had a very different history in the Dominion of Canada from that which it has had in the United States. There are a few institutions in the provinces of that vast Dominion which stretches over the wide area between the Atlantic and Pacific which are under some measure of state control, and which receive a certain share of state support but no general policy looking toward the support of higher education has been adopted by the general government of the Dominion, nor has the state university, as that term is understood in Germany and America, taken firm root in the Canadian system of education. The idea of the secular college or university supported and controlled by the state as a part of its

educational system, offering to all citizens, at nominal cost, instruction in the highest university studies, is a product of German soil, and is the gift of the German people to civilization. It is a very interesting fact that while the Germans have never succeeded in putting into effect a practical scheme of political freedom with any such degree of success as the English, they have outstripped their English neighbors in the realization of the ideal of intellectual freedom, and the gift of this ideal to the world is perhaps the noblest achievement of the German people.

That the system of public education in the United States should have followed the ideals of Germany rather than those of England is the result of many causes. In the list of these causes, one often overlooked, is the contribution of German citizens themselves who came to the United States. After the failure of the revolution of 1848, great numbers of Germans of the best social standing and of the highest intellectual ambitions and abilities, emigrated to the United States. The most of these settled in the Central West, and they contributed greatly to the shaping of the intellectual ideals of that region. No more fortunate event has happened to the United States than the coming of this great body of intelligent and highly educated men in the early fifties, and in no respect did they have a more marked influence than in the shaping of our educational ideals. This influence served to counterbalance in some degree the strong denominational tendency of the native population. The professors whom they furnished to our universities had a profound influence upon the thought of the young men whom they taught, and they had much to do with the acceptance of the idea of a free secular state institution as the crown of our educational system in these Western states.

This ideal of the state college or a university is, however, one which has never found congenial soil among men raised under English social and political conditions. In England itself the church is so strongly entrenched in the political and social life of the country, and has for so many centuries had so strong a hold upon the institutions of higher education that perhaps it is entirely natural that Englishmen should find it difficult to conceive of a college separated from some church organization. Where effort has been made to realize such an ideal in the English colonies, it has had to encounter a strong current of opposition from men who felt most sincerely that state education must necessarily be not only godless but, still worse, not quite respectable.

A history of government support of higher institutions in the various provinces in Canada forms an interesting example of the tendency to which I have just alluded. In the enormous area stretching from the Atlantic to the Pacific there are a bare half dozen institutions which are in one sense or another under the control of the various provinces and receive partial support from them. There are in Canada thirteen universities and eighty-six colleges, the great majority of which are under denominational control. Of these, the University of New Brunswick, the University of Toronto, and the University of Manitoba possess university privileges.

The University of New Brunswick had its beginning in 1800, and was incorporated as a college by a Provincial charter. In 1828 a royal charter

was granted by the Crown incorporating the college under the name of King's College. In 1859, however, an Act was passed by the Parliament of the Provinces establishing the University of New Brunswick and presenting to the newly established institution all the rights and privileges of King's College with an endowment.

This Act also provided that the president should be a layman and abolished the professorship of theology, but provided for the affiliation of other institutions with the university. The royal order confirming this Act of the Legislature of New Brunswick was passed in 1859. The university has had an honorable history, and is likely to do a work of increasing value as time goes on. Its academic standards are, however, not yet equal to those of the stronger universities, and it would not at this time be eligible to admission to the list of accepted institutions. Nor does it seem possible that its standards can be materially bettered until this excellent institution receives a more generous support from the Provincial government.

The University of Manitoba was established by an Act of the Legislature of that province in 1877. It has the sole power of conferring degrees in arts, law, and medicine in the Province of Manitoba. The government of the university is vested in a chancellor appointed by the Lieutenant Governor and a council of fifty-five members. Affiliated with the university are a number of colleges including those of the following denominations: Roman Catholic, Church of England, Presbyterian Church in Canada, and Methodist Church in Canada. This institution, like that of New Brunswick, is undoubtedly destined to a noble and useful work for the Province. At present its work in arts and sciences is of an elementary character, and would not entitle it to admission to the benefits of the Carnegie Foundation on the ground of academic standard. The support accorded by the Province is a grant of \$6,000 annually.

At this time Alberta and Saskatchewan are legislating for a Provincial university, while in British Columbia a partnership has been made between McGill University and Vancouver College. All these efforts at state support of higher education are directed toward the establishment of some form of state university, but the ideal of institution which is contemplated is not that of a pure secular university supported and controlled by the state and independent of denominational affiliations. They represent in almost all cases compromises between the ideal of the state university and the denominational college.

The University of Toronto is an institution whose work and history have given it a high place among the universities of this continent. Its history is an interesting story of the compromises between the aspirations of a part of the people of the province for a free secular university, and the convictions of others who sought church control for the institution.

As early as 1790 the establishment of a college of the higher class in Upper Canada was recommended by its first governor, but the actual beginning of the university was due to a charter for "the University of King's College," procured by Dr. Strachan in 1827. The charter provided for a distinctively

Church of England institution, and thereby began a discussion which has not yet ceased. Opposition of other church organizations was shown not only by hostility in the legislature, but also by the starting of other denominational colleges. Under this opposition the opening of the college was postponed until 1848. In 1849 an Act was passed which practically secularized the university, while aiming at the same time to make it a state university and a common place of training for the youth of the country, irrespective of creed. It was passed under the belief that the denominational institutions would abandon their degree-giving powers and group themselves amicably about the state university.

This last assumption proved groundless and failed to take into account the deep-rooted convictions of men trained in special forms of religious belief. Bishop Strachan, the founder of King's College, was one of the most earnest opponents of the measure, and with indomitable courage set himself to the task of procuring a charter for a university of the Church of England. His announcement as he started to England on his mission reveals at once the pathetic and the bitter side of the long controversy.

"I shall have completed," he writes, "my seventy-second year before I can reach London, of which more than fifty have been spent in Upper Canada, and one of my chief objects during all that time was to bring King's College into active operation; and now after more than six years of increasing prosperity to see it destroyed by stolid ignorance and presumption, and the voice of prayer and praise banished from its walls, is a calamity not easy to bear. I shall not rest satisfied till I have labored to the utmost to restore the college under a holier and more perfect form."

The result of this legislation did not make for harmony, and the constant complaints against the state university that it was a godless institution were even more bitter than those which thirty years ago were urged against the state universities of the United States. A further attempt was made in 1858, by an Act which still asserted the principle of the state university, to provide an arrangement under which the denominational colleges might be willing to affiliate themselves with the university.

To those who are familiar with the history of education in the United States it is interesting to note that these efforts of the strongest of the state universities of Canada to bring about affiliation between the state institution and the denominational colleges was prompted not by political consideration alone, but also by a second reason which had great weight. The early charter of the University of Toronto was modeled after that of the University of London, and in England there had been a constant effort to prevent the rise of small colleges with the right to grant degrees, and one object of the friends of the State University of Ontario in consenting to the affiliation of the denominational colleges was to confine the granting of degrees, if not to one source, at least to strong institutions maintaining high academic standards.

This is a motive with which we in the United States may well sympathize, however we may regret the sacrifices that were made to attain it. In our country the state legislatures have gone to the opposite extreme. Colleges,

which are colleges in name only, have been granted without limit the privilege of conferring college degrees. Institutions, whose courses of study would scarcely admit the student to a real college confer upon their graduates the degrees of bachelor of arts and bachelor of science. Professional degrees in law and medicine have been granted under shameful conditions. Nevertheless, the inevitable working out of the law of the survival of the fit is slowly dealing with this matter, and we can begin to see in the United States the end of the period when degrees will be granted in such loose fashion; and looking back over our experience, notwithstanding the harm which this practice has done to the dignity of academic degrees and to the validity of academic standards, it seems on the whole wiser to have left this matter to the working out of the law of the survival of the strong rather than to control it arbitrarily by bringing together in one organization institutions which had no real reason for association.

The Act of 1849 was the law under which the University of Toronto lived up to 1887, when an Act was passed known as the Act of Federation. A few years before this the legislative grants had been withdrawn from the denominational colleges. The financial needs of the new university were great, and new demands for scientific laboratories and improved methods of teaching entailed increased cost. The result of the Act of Federation was to secure a university financially stronger and to secure at the same time the affiliation with it of certain denominational colleges. This Act has been the basis of the conduct of the university until the past year. The result of all these acts was the formation of one of the most complicated plans of administration and the creation of an institution made up of as many diverse elements as one can well imagine. The supreme authority was vested in the Crown as represented by the Lieutenant Governor of Ontario, but the purse was in the keeping of the legislature. There were three governing bodies—a board of trustees, a senate, and a university council. The executive responsibility was divided between a president, a chancellor, and a vice-chancellor, each with vaguely defined functions. No less complicated was the university on its academic side. It maintains departments of arts, medicine, law, and applied science. In the faculty of arts are three colleges—one college supported by the state as a state institution, and two affiliated denominational colleges, Victoria and Trinity. The university also, although a state institution and representing distinctly an undenominational theory of education, embraces three purely theological colleges—Knox, Wycliffe, and St. Michael's, three names which suggest with sufficient distinctness the particular theology to which each is devoted.

In comparison with this complicated organization, with its innumerable compromises to reconcile divergent aspirations and beliefs, the organization of the governing body and the faculty of the American state university is simple indeed.

In 1895 there was appointed a commission to study the whole plan of the management and government of the University of Toronto, and to propose such modifications as in the judgment of the commission might be desirable. This commission was composed of men of high standing and ability, and their report,

which was presented to the Lieutenant Governor in April, 1906, deservedly carried with it great weight. The committee unfortunately found itself greatly hampered in the endeavor to reconcile the conflicting ideals of provincial government and the no less conflicting ideals of secular and denominational education. Its recommendations were important in one respect at least—that the immediate management and control of the university should be vested in a board of governors, thus referring the government of the university to a permanent responsible body rather than to the shifting influences of changing parties. The committee also recommended an enlargement and dignifying of the offices of the president and a simplification to some extent of the complicated method of administration and of dealing with the various faculties. Practically all the recommendations of the commission were enacted into law in a measure approved the 14th of May, 1906, and this is now the law which governs the university.

As one considers the complicated system of administration which still remains, one cannot but regret that the commission should have felt so strongly the necessity for the preservation of certain traditions of university government. It is evident all through the report that the committee continually recommends measures which are compromises rather than expressions of its own clear convictions. Doubtless this commission, with its thorough knowledge of the political and social conditions of Ontario, knew better than any outsider can know what was feasible and wise. Yet one cannot but regret that there should not have been more consideration of a clean-cut plan for a university supported by the state, the crown of the public school system, responsible to the government of the province through a simple administrative board, and unencumbered with the load of rival denominational ambitions.

It goes without saying that the University of Toronto, with its fine history of scholarship behind it, is an institution which would be gladly welcome, so far as academic considerations are concerned, to the list of institutions admitted to the benefits of the Carnegie Foundation. Under the rules of administration which were imposed by the founder, it would seem clear that only those professors of the university could be eligible who belong to departments free of denominational control—in other words, who belong to portions of the university which are essentially state institutions.

The question whether these should be admitted to the benefits of the retiring allowance system is, it seems to me, an entirely different one from that which is raised by the similar proposition in the United States. There we had to deal with a series of institutions maintained throughout the states of the Union, originated in response to a definite policy on the part of the national and state governments. In Canada, on the other hand, there is no such national policy, and the only state institutions which would at the present time be eligible to the list of accepted institutions are those parts of the University of Toronto which are free of denominational control. The question of public policy does not arise in the same way as it does in the United States. The situation is somewhat the same as it would be if there existed in the United States only four or five state universities which had arisen

sporadically by the efforts of individual states, one in New England, one in the South, one or two in the Central West, and one in the far West, which were not the result of any general policy of Government or state support, and which were not likely to grow in number. In such a case, the question of their admission would be an entirely different one from that with which we have had to deal, and the question with respect to the admission of the Canadian colleges which receive their entire support or a part of it from a Province is somewhat similar. It is not a question of general public policy, but a question of the larger interests of education in the province and region in which the institution stands. It seems clear to me, therefore, that at this time we are not called upon to make any final decision with respect to the admission of these Canadian institutions, but that we may leave this matter to be settled in the future as the individual cases may arise, in accordance with such considerations as the general interests of education in Canada may show to be wise. The essential facts with respect to the University of Toronto are, that here is a great institution formed in accordance with the political and religious ideals of the people of the province, a center of moral and intellectual influence which has made the university a factor in the civilization of the continent. The question whether it should be admitted to the benefits of the retiring allowance system of the Carnegie Foundation is one to be settled on the ground of the influence which such action might have on higher education in the province most directly interested in the university.

HIGHER EDUCATION IN NEWFOUNDLAND

In Newfoundland the government has pursued the policy of subsidizing denominational schools. None of these institutions are as yet of college rank, and any consideration of their claims must await further information and a later development of the educational system itself.

**THE CARNEGIE FOUNDATION
FOR THE ADVANCEMENT OF TEACHING**

**THE FINANCIAL STATUS OF THE PROFESSOR
IN AMERICA AND IN GERMANY**

BULLETIN NUMBER TWO

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PREFACE

The Carnegie Foundation for the Advancement of Teaching was instituted for the betterment of the calling of the teacher in the three English-speaking countries of North America. It aims to do this directly by establishing in higher institutions of learning an efficient system of retiring allowances for professors.

Not only must the teacher's calling be made more secure but the compensation of the teacher must also be bettered and he must receive from the institution for which he works a salary sufficient to enable him to live in comfort and to educate his children.

While general statements have been made in various publications concerning the rate of compensation of the American teacher, and while comparisons have been made with the pay of foreign teachers, no trustworthy information has been at hand to show just what is the compensation of a teacher in different institutions and how it compares with the pay of a foreign professor. During the short time in which the Carnegie Foundation has existed a carefully planned effort has been carried out to secure this information from various colleges and universities in the United States and Canada. The statistics which are given in the following Bulletin have been obtained directly from the institutions themselves.

There are in the United States and Canada approximately one thousand institutions bearing the name "college" or "university." These institutions are of all possible academic grades between a true university and an indifferent high school. Roughly speaking, nearly one half of these institutions are not colleges in any true sense, and the pay which their teachers receive is proportionately small. It would manifestly be unjust to base any estimate of the pay of the teacher in the stronger colleges or universities upon a comparison made with this latter class of institutions. No criterion perhaps can be chosen for dividing our colleges and universities which is not artificial and arbitrary; but on the whole it has seemed fairest to compare together the institutions having the highest annual salary roll for teachers. The information which follows rests in the main upon a group of approximately one hundred institutions in the United States and Canada which pay the largest total amount annually in the way of salaries to their instructing staffs. The stronger institu-

tions in the United States and Canada are so similar in organization, rest upon a system of public instruction so nearly the same, and pay on the average salaries so nearly comparable that there would be no gain in exhibiting the statistics of the two countries separately. On the other hand there is every advantage to both countries in an interchange of educational information and in an exchange of teachers. The establishment by the Carnegie Foundation of a uniform system of retiring allowances in both American and Canadian institutions facilitates such an exchange.

The results here given show that the average salary of a full professor in these one hundred leading institutions varies from \$1,350 to nearly \$4,800, and that in the average it is somewhere near \$2,500. In other words, the full professor in the one hundred institutions in the United States and Canada which are financially strongest receives on the average an annual compensation of approximately \$2,500.

It will be evident to any one who inspects these tables that the variation in salary corresponds in considerable measure to the variation in the cost of living. It is clear that in a small town in the middle west, in which house rent is one hundred dollars a year and in which servant hire is ten dollars a month, a salary of \$2,000 may well be a comfortable one, while a salary of \$4,000 in New York will not secure equal advantages. In other words, there is for each locality an approximate line of comfort in the remuneration of such a member of the social order as a professor. The individual receiving a salary above this line is comfortable; the individual receiving a salary below it must have more or less worry over the financial problem. In one case, it means better service, certain additional comfort, the ability to send a boy or a girl to college, and above all, freedom from financial worry. A salary below this line means a struggle to live and to educate the children of the family. While college salaries can never be made the equal of those paid in large business enterprises, it is clearly to the interest not only of the professor himself, but of the students and of society in general, that his salary should in all places approach the line of comfort. That it does not do so in most American colleges is only too clearly proven by the statistics given in this Bulletin.

These statistics show in brief that an American teacher who has gone through college, taken a post-graduate course, and prepared himself for the profession of teaching, may hope to obtain at the age of twenty-eight a salary of \$1,250, at thirty-one a salary of \$1,750, at thirty-three a salary of \$2,250, and at thirty-five—at which age the able man will have gained his professorship—a salary of \$2,500.

Above all, the career of a professor in America is discouraging from a financial point of view in the absence of any large prizes. In only two or three institutions does the maximum salary amount to \$5,000, and these maximum salaries are open to a very small number even in the institutions which pay them.

For the sake of comparison the second part of this Bulletin contains an exhibit of the financial status of the German professor. A study of the two will show that the German university professor may expect in time a far greater financial and social reward than comes to his American colleague. He has, furthermore, a place of far greater security and with full protection for old age and for his wife and children. The German practice is particularly in contrast with that in the United States by reason of the fact that it includes a scale of remuneration which can fit a wide scale of merit. The struggling privat-docent has a bare living, but the better known teacher may hope to get a financial return comparable with that of a well-established lawyer or physician.

On the other hand, there is a marked contrast in the length of preparation to which the German professor submits in comparison with that of the American. A German who possesses such ability that he may expect in due time to become a full professor and who prepares himself for university teaching must expect to study until the age of thirty with no financial return, to study and teach as a docent till nearly thirty-six with an annual remuneration of less than \$200, and to teach from thirty-six to forty-one with an annual remuneration of from \$600 to \$2,000, by which time he may become a full professor and will continue to receive his salary until his death. In other words, the road to a professorship in a German university involves a period of training and of self-denial far longer and more exacting than that to which the American professor submits.

The essential contrasts between the American and the German professors brought out by the statistics here given are, therefore, these: the German must submit himself to a far more rigid régime, must attain a far higher grade of scholarship, and must go through an experience under which the weaker men are weeded out. If he succeeds, however, he may hope for a much larger reward and be assured of security in old age.

It will be evident to one who examines with care the status of the American college professor that the low scale of salaries which obtain in most institutions is due in no small measure to the multiplication of weak and unnecessary colleges. No two causes have had a larger share in bringing down the financial reward of the teacher and of taking away from the dignity of his position than the tendency to multiply the number of colleges with little regard to standards and the tendency to expand the curriculum over an enormous variety of subjects without regard to thoroughness. A college of ten professors who are strong teachers, commanding fair compensation and teaching only such subjects as they can teach thoroughly, is a far better centre of intellectual life than a college which seeks with the same income to double the number of professors and to expand the curriculum to include in a superficial way the whole field of human knowledge. It is a true college that chooses to add to its curriculum only so fast as it can provide fair salaries for the work already in hand. It is clear from the

statistics of institutions given in this Bulletin that the low grade of college salaries in a certain group of American institutions is due to the attempt to maintain a university with an income which is adequate only to the maintenance of a good college. The scholarly atmosphere maintained at some institutions, whose smaller income has placed them in the second group of institutions for which statistics are presented, is fairly well connected with the relatively high salaries they pay to professors.

The payment of a fair salary to the teacher is also directly connected with the output of scholarly work and the advance of research among college and university teachers. A large proportion of the teachers in American universities are engaged in turning the grindstone of some outside employment with one hand whilst they carry on the work of the teacher with the other. Owing to the rise in the cost of living the proportion of teachers who seek to increase their incomes in this way is very large. The method of organization of the American university also throws a large amount of executive work upon members of the faculty. For this extra compensation is sometimes paid. Both processes cut down the opportunity for scholarly study and take away from the dignity, simplicity, and highmindedness of the teacher's calling.

While there are facts on the financial side of American teaching here exhibited which are to be regretted, it is nevertheless true that notwithstanding the present small financial reward, the future of the American teacher looks brighter than it ever has before. Colleges are beginning to discuss with seriousness the need of strong teachers as distinguished from the need for material equipment. This fact itself is a hopeful indication of educational progress. A movement is on foot among all of the better institutions to make the salary of the teacher approximate what might be called the line of comfort. In addition to this, there is being established in a large number of American institutions a system of retiring allowances under which a teacher receives as a right the retiring pay after his active service ceases.

All of these things look toward a new appreciation of the dignity, the worth, and the attractiveness of the teacher's life. No man is likely to choose this life for the love of gain, or from considerations of material advancement. The great majority of college teachers probably never consider the financial returns of their profession on a competitive basis with other professions. The attraction which leads able men into the teacher's calling springs from two sources—first the sense of power and responsibility which the true teacher feels; secondly, the love of study and of the scholar's life.

The first of these causes is perhaps the more important. Institutions of higher learning, whether they devote themselves to religion, technology, or literature, maintain honestly that they stand for truth. Sensitiveness for honor is high in officers and students; and the professor must not only be a part of this forward movement, but he must be a leader in it. Success comes to him

only by taking worthily the position accorded to him as the appointed guardian of the ideals of his community.

This leadership, which involves personality, character, and scholarship, reacts upon the professor himself at the first moment of success, and in this fact lies the secret of his devotion to his work. The professor's life becomes permeated with a quiet force, the value of which is realized only when one comprehends what a power a student body is for good or evil. These students are a power not only among themselves, but they are a tremendous influence upon the community, and it follows naturally that every action of the professor touches vitally the stability of the community and of the country. Such leadership, such demands of gentlemanliness, bring with them a reward compared with which a few hundred dollars one way or the other in salary are of small significance. The professor confidently does not accept other men's valuation of his work when it is estimated by the tuition fees of his students. But, held in a position of highest dignity by those about him, he lives a life of frugality, of simplicity, of influence, and above all, of happiness. He lives, as Mr. Lowell observed, in the only recognized aristocracy in America.

The second important consideration for the professor is his opportunity for research. Since the development of graduate schools in American universities it is no longer sufficient for the professor to be merely a middleman in the distribution of knowledge, passing on year after year the same information taken from the same text-books. An important function of the modern university is the extension of the domain of knowledge; and a university in order to maintain its rank among the leading institutions of its kind in the country must contribute to this extension. It must be productive. The professor, therefore, feels it a duty to his college or university and to his own standing in his profession to keep in touch with what is being accomplished by scholars all over the world in his special department of study. He must himself be a productive scholar. In such work he finds great reward in terms of worth and dignity and intellectual satisfaction.

Under the present salary schedules and administrative methods in many American universities this scholarly productiveness is carried on against greater obstacles than are similarly presented in the universities of Germany and of England. The scholar's work is seldom remunerative in a financial sense. The writer of popular text-books and magazine articles receives not only a fair financial return for his work, but also obtains a popular reputation which is to his advantage. The scholar, on the other hand, who by his industry becomes a first authority in any branch of science or of literature will receive scant financial return for the publication of his monographs, but he wins through such publication high honor and respect among scholars for himself and for his university. During the last decade especially there has been a decided impetus among a few institutions of higher learning to recognize the value of such scholarship and to

foster it. The time has now come when many colleges and universities must attract men capable of such scholarship and offer them in connection with their teaching the opportunities for its cultivation.

The attractiveness of the teacher's profession thus depends upon the love of teaching itself and the opportunity for scholarship. It is obvious that these attractions will have force enough to hold the best men only when the teacher receives a remuneration adequate for the needs of himself and family, and when he has the definite assurance of a sufficient provision for his old age.

I beg to express on the part of the Carnegie Foundation its thanks to the college authorities who have furnished the data upon which the Bulletin is based. College authorities have hitherto been inclined to take the position that the public is not concerned with the details of the financial administration of institutions of learning. I wish to urge that the policy of publicity in these matters is the only true one. The public which supports a college is entitled to know how the college income is spent, what proportion goes into administration, what salaries are paid, how much is spent in advertising and other details of expense. It has been a source of strength to the state universities that these details (including the exact pay of each officer and teacher) must be printed for public inspection. A thoroughgoing financial statement of investments, annual receipts and expenditures should be required by law of all chartered institutions. Colleges and universities should do this without legal requirement as a matter of good faith.

Material for this Bulletin so far as American and Canadian institutions are concerned was obtained by the officers of the Foundation from the institutions themselves. The data concerning the German professor was gathered in a most complete and effective way by Dr. A. A. Snowden acting for the Foundation.

The arrangement and analysis which are presented in the following pages are due to Professor E. L. Thorndike of Teachers College, Mr. John G. Bowman, and Mr. Monell Sayre of the Carnegie Foundation.

HENRY S. PRITCHETT.

April, 1908.

ORGANIZATION AND CLASSIFICATION OF COLLEGES AND UNIVERSITIES IN THE UNITED STATES AND CANADA

The Carnegie Foundation for the Advancement of Teaching, in seeking to carry out its primary object of establishing a retiring allowance system in the colleges, universities, and technical schools of the United States, the Dominion of Canada, and Newfoundland, has found it necessary to conduct various enquiries into the condition of education in these three countries. Among the first of these studies was one which had to do with the salary and tenure of office of the professor and of other officers of instruction. The results of that study are given in the present bulletin and are based upon data supplied by some seven hundred and fifty institutions in the United States and Canada, the figures given in all cases being presented exactly as they were received from the officers of these institutions.

The organization of colleges and universities in the United States is fashioned very much after that of business corporations; the board of trustees corresponding to the board of directors, the chairman of the board to the chairman of the board of directors, the president of the college to the general manager. The president is the connecting link between the administrative body of trustees on the one side and the teaching body on the other.

In Canada the organization is somewhat more democratic, the governing boards in most cases being elected from the alumni and containing generally members of the faculty.

The instructing staff in most institutions, both in the United States and Canada, consists of professors, associate professors, and assistant or adjunct professors. These form the faculty or permanent body of teachers. In addition there are grades of instructors, lecturers, tutors, and assistants whose positions are in greater or less measure temporary.

Not all of these offices appear in all institutions. Even in some of the larger universities there are only two grades in the faculty, the professor and assistant or adjunct professor. In many smaller colleges the greater part of the teaching staff is included in the faculty with a very limited number of instructors and assistants. The grade of preceptor is unique in Princeton, where its holders are considered of faculty rank.

While this paper will deal, so far as seems necessary to render clear the status of the professor, with all of these grades of the instructing staff, it is upon the holder of the professorial title as embodying the force and tradition of college teaching that the attention will be principally directed.

As was pointed out in the Second Annual Report of the President of the Foundation, the words "college" and "university" have no well settled meaning

in America, nor is the sphere of higher education by any means carefully defined. As a result the degree-giving institutions in these countries present every variety of educational and administrative complexity. Even the well-informed educator is apt to speak of our colleges and universities as if they formed a homogeneous species conforming more or less clearly to some typical condition. Not only is this not the fact, but these institutions do not even fall into any definite number of such species. There is no method of classification which, when applied to the thousand American and Canadian degree-conferring institutions, will enable the student to divide them into clear species. Whatever criterion is chosen will result in placing some institutions in company to which they are not entitled to belong.

The number of students, or the "bigness" of the college or university, is probably the most usual method of classification. But in regard to the number of students one finds a range continuous from institutions with fifty students to institutions with five thousand, and if in this continuous series arbitrary lines are drawn, the groups thus made put together institutions whose consideration side by side could serve no useful purpose; for instance, Johns Hopkins University with the University of Southern California, Yale University with the Temple College, and Williams College with Maryville College.

The size of the teaching staff would naturally be considered a more scientific method of classification, but here again there is a continuous gradation from institutions with five to institutions with five hundred teachers, and groups selected on this basis would result in such incongruities as placing Valparaiso University with Leland Stanford Junior University, Union College, Nebraska, with Amherst College, and Howard College at Birmingham, Alabama, with Ripon College.

The maintenance of professional schools might be considered as a significant line of cleavage, but such a means of demarcation, which would put in the supposedly less important group Princeton, Brown, Wesleyan, Vassar, Bryn Mawr, and Trinity (Hartford), and in the higher group such institutions as Hamline University, Epworth University, Baylor University, Kansas City University, and some forty or fifty other essentially minor institutions cannot be considered an illuminating classification.

The presence of a certain number of resident graduate students is a significant feature of an institution for higher education, and might be used with advantage in a classification if graduate students in the various institutions had to comply with similar requirements before being enrolled. It is true that the graduate student must have received a college degree, but a collegiate degree in the United States means anything from a bachelor of arts or a bachelor of science of such an institution as the Ohio Northern University, Ada, Ohio, up to the bachelor of arts and bachelor of science of such universities as Columbia, and the University of Chicago. Until the collegiate degrees begin to have a definite meaning, it will be futile to base any classification upon the graduate schools, which essentially rest upon these degrees.

The annual income is one of the better ways of grouping American colleges and universities, because a 'dollar' is somewhat the same all over the United States; whereas a 'student' may mean a person in the 'School of Oratory' or a candidate for the degree of doctor of philosophy. The word 'teacher' may mean a full professor working exclusively for his college or a musician in Chicago who is the 'non-resident director' of the schools of music of a chain of small colleges throughout Illinois and the adjacent states, the same individual being counted thus in a score or more of college catalogues. The test of annual income, however, fails to divide institutions into any sharp groups. The institutions range almost continuously from so-called colleges receiving an annual income of eight hundred and fifty dollars up to universities with a yearly budget of a million and a half dollars. It is true that between six hundred and fifty thousand dollars a year income and eight hundred and fifty thousand dollars a year income occurs a break, but there does not seem any solid reason why the ten universities above this break should be considered apart from the Universities of Missouri, Toronto, Pennsylvania, Minnesota, and Nebraska, which come immediately below.

It must also be noted that the figures in regard to annual incomes are not absolutely to be relied upon. Many institutions say frankly that the return under this head is only an approximation, and although the Foundation has made every effort to exclude such extraordinary items as gifts, special legislative appropriations for the erection of buildings, etc., from this calculation of annual incomes, it cannot feel certain that in all cases the figures given under this head represent the normal yearly income of the institution—the income which can be devoted to running expenses. Thus the Ohio State University at Columbus, in estimating its annual income, included the unexpended balance of a legislative appropriation for building operations granted several years before, and Harvard University included in its annual income the value of certain securities which it had sold during the year in order to make a reinvestment. The Foundation has been unable to obtain copies of all college treasurers' reports, and so has been unable to check all the returns made. Such inclusion of building appropriation, bookkeeping items, etc., will doubtless account for some cases where, according to the institution figures, a disproportionately small percentage of the income is devoted to the salaries of the instructing staff. In many small colleges, on the other hand, the regular income is insufficient to pay the salary account, and it is necessary every year to make up the deficiency by the solicitations of gifts.

It may be mentioned here that the income of the University of Oregon, as given in the following table, is the income appropriated for it by the legislature a year and a half ago. The legislature of 1907 passed an act making an annual appropriation to the university of \$125,000, but the referendum has been invoked against this act under the new initiative and referendum provision of the constitution of Oregon and the university, therefore, cannot tell whether it will

It will be seen from the table that five-ninths of the institutions making reports have an instructional pay-roll of less than twenty thousand dollars. Failure to report this item is very common among the smaller institutions. Almost all the large institutions, on the other hand, send in this report. It is therefore safe to say that if the figures were obtainable in every case, two-thirds of the degree-granting institutions of the United States and of Canada would show a budget for teachers' salaries of less than twenty thousand dollars. Seven-ninths of the institutions making reports spend less than fifty thousand dollars on instructional salaries. If the list were complete, institutions of this character would number six-sevenths of those granting degrees.

The average salary of a professor is reported in many more cases by the college authorities than is the college's total annual expenditure in professorial and other instructing salaries. From a study of these figures it appears that one-third of the degree-granting institutions pay on an average less than a thousand dollars a year to their full professors; indeed in thirty-five institutions making reports the average salary of the full professor is less than five hundred dollars a year. These salaries are poor enough under any circumstances, but it must be remembered that most of the institutions paying such salaries are not colleges in any sense, except that they are called colleges and that they confer collegiate degrees. These poorly paid professors are therefore not really doing the work of higher education, nor have they in most cases given themselves adequate preparation for college teaching. In the vast majority of cases these professors are teaching high-school and even grammar-school subjects; they have devoted to their training only the time ordinarily given to preparation by a teacher in secondary education; and their salaries, although small, are not so utterly incommensurate as they would be if paid to a professor doing collegiate work.

To study the financial standing of the teachers in all of the degree-granting institutions would therefore be to deal with a large number of institutions that are simply high schools. Conclusions drawn from such a heterogeneous group would be of little value. Yet to draw a line across this ascending scale of college salary budgets is a difficult task. Wherever the line is drawn there will be reasons for moving it down to include a few more institutions or up to have it exclude a few others.

It will necessarily be an arbitrary line, but at one place in the gradation of institutions it will be less an arbitrary line than if drawn at any other place. A glance at Table I shows that at the point where forty-five thousand dollars a year is spent on salaries to the instructing staff the number of institutions drops sharply. Above this abrupt drop are one hundred and three institutions. Let us therefore take these institutions as typical of American higher education, and see what are the results obtained from an analysis of the status of their professors and instructors. Table II gives these one hundred and three institutions, with their appropriate figures, in the order of their annual expenditure in teachers' salaries.

It may be that there are colleges not included in Table II which are better representatives of higher education than some which are there listed. The table does not pretend to give the one hundred institutions in America which are the best from an educational point of view, any more than the arrangement of institutions in the table is meant to indicate anything beyond the total size of the annual salary accounts. The value of this table is that it is an impersonal selection of colleges and universities according to a fairly representative criterion. For the purposes of this table, it is more valuable to have the selection made according to an objective standard which everyone can estimate, than to have a more exact approximation into which personal judgment enters.

The Foundation recognizes, however, that the salary budget of an institution is closely related to the size of the institution, and that the size of a college is an imperfect method of estimating its educational value. Table IX, in a later part of this paper, is therefore intended as a necessary supplement to Table II. It contains the names of fifty-four institutions, which were not included in Table II on account of the comparative smallness of their expenditure for salaries, and yet which in the opinion of the Foundation ought to be considered if the higher education of the United States is to be rightly estimated. Table IX and the discussion thereon will show what excellent educational results can be obtained by resources which are within moderate limits.

These two tables, the one a purely objective selection on a mathematical basis, the other, an attempt of the Foundation to correct the false impression which a selection only on that standard might give, will together present an approximately complete statement of the financial status of the teacher in the institutions of higher education in the United States and Canada. Nevertheless the total number of institutions which assume to deal with the higher education cannot be disregarded, although many of them are occupied in a large part with education that is not of a collegiate grade. While these colleges of meagre support and limited facilities cannot be grouped, as mentioned before, in significant educational divisions, it is evident to one who studies the countries as a whole that the problem of higher institutions must be taken up from the standpoint of the state or province as a unit. The state governments have themselves in all cases a system of education limited by state lines. The same denominations have erected colleges and universities in different states, so that the problem of higher education is almost necessarily studied from the standpoint of the state.

Looked at from this standpoint, it is evident that if the system of higher education is finally to have unity, strength, and thoroughness, enormous sums of money must be spent to develop these numerous institutions, or else many of them must be in the end abandoned. One can scarcely doubt that the latter course will finally come about by the mere progress of events, for there can be no doubt that many of these institutions are wholly unnecessary. They have been produced partly from a genuine interest in education; partly by denomina-

TABLE

DEGREE-CONFERRING INSTITUTIONS IN THE UNITED STATES AND CANADA
SALARIES OF THEIR

Institution	Total Annual Income	Annual Appropriation for Salaries of Instructing Staff	Average Salary of Professor	Average Age at Entrance to Grade of Professor	Average Salary of Associate Professor	Average Age at Entrance to Grade of Associate Professor
COLUMBIA UNIVERSITY New York City.....	\$1,675,000	\$1,145,000	\$4,289	37.5	.....	.....
HARVARD UNIVERSITY Cambridge, Massachusetts.....	1,827,789	841,970	4,413	39	\$3,600	.....
* UNIVERSITY OF CHICAGO Chicago, Illinois.....	1,304,000	699,000	3,600	.....	2,800	.....
UNIVERSITY OF MICHIGAN Ann Arbor, Michigan.....	1,078,000	536,000	2,763	.....	2,009	.....
YALE UNIVERSITY New Haven, Connecticut.....	1,088,921	524,577	3,500	35	.....	.....
† CORNELL UNIVERSITY Ithaca, New York.....	1,082,513	510,931	3,135	.....	.....	.....
UNIVERSITY OF ILLINOIS Urbana-Champaign, Illinois.....	1,200,000	491,675	2,851	.....	2,168	.....
UNIVERSITY OF WISCONSIN Madison, Wisconsin.....	998,634	489,810	2,772	32.8	2,081	29.6
UNIVERSITY OF PENNSYLVANIA Philadelphia, Pennsylvania.....	589,226	433,311	3,500	.....	.....	.....
UNIVERSITY OF CALIFORNIA Berkeley, California.....	844,000	408,000	3,300	.....	2,200	.....
LELAND STANFORD JUNIOR UNIVERSITY Stanford University, California.....	850,000	365,000	4,000	35	2,700	32
UNIVERSITY OF TORONTO Toronto, Ontario.....	610,000	324,000	3,600	42.5	.....	.....
* PRINCETON UNIVERSITY Princeton, New Jersey.....	442,232	308,650	2,914	35	.....	.....
MASSACHUSETTS INSTITUTE OF TECHNOLOGY Boston, Massachusetts.....	505,000	301,000	3,192	38	2,115	37
UNIVERSITY OF MINNESOTA Minneapolis, Minnesota.....	515,000	263,000	2,600	32	.....	.....
OHIO STATE UNIVERSITY Columbus, Ohio.....	475,000	244,000	2,041	.....	1,692	.....
UNIVERSITY OF NEBRASKA Lincoln, Nebraska.....	425,000	240,000	2,200	35	.....	.....
UNIVERSITY OF MISSOURI Columbia, Missouri.....	655,000	239,110	2,355	33	.....	.....
MCGILL UNIVERSITY Montreal, Quebec.....	425,000	225,000	3,060	.....	2,150	.....
NEW YORK UNIVERSITY New York City.....	303,500	220,000	3,466	.....	.....	.....
NORTHWESTERN UNIVERSITY Evanston, Illinois.....	491,132	218,157	3,265	35	2,325	33
JOHNS HOPKINS UNIVERSITY Baltimore, Maryland.....	311,870	211,013	3,184	.....	.....	.....

RIATING ANNUALLY \$45,000 OR OVER FOR THE TOTAL PAYMENT OF THE
CTING STAFFS

Average Age at Entrance to Grade of Assistant Professor	Average Salary of Instructor	Average Age at Entrance to Grade of Instructor	Average Salary of Assistant	Average Age at Entrance to Grade of Assistant	Total Number of Students in University	Total Instructing Staff in University	Ratio	Total Number of Students in Undergraduate Colleges and Non-professional Graduate Schools	Total Instructing Staff in Undergraduate Colleges and Non-professional Graduate Schools	Ratio
32	\$1,800	29	\$500	24	4,087	559	7.3	2,545	253	10
33	1,048	28	347	26	4,012	573	7	2,836	322	8.8
.....	1,450	.....	666	.....	5,070	291	17.4	3,902	211	18.4
.....	1,114	.....	.....	.....	4,282	285	15	2,899	198	14.6
29	1,400	24	.....	23	3,306	365	9	2,620	236	11.1
.....	924	.....	.....	.....	3,635	507	7.1	2,917	283	10.3
.....	1,091	.....	660	.....	3,605	414	8.7	2,281	190	12
28.6	1,065	27.5	542	24.5	3,116	297	10.4	2,558	231	11
.....	1,000	.....	650	.....	3,700	375	9.8	2,618	166	15.7
.....	1,100	.....	850	.....	2,987	350	8.5	2,451	218	11.2
29	1,250	26	.....	24	.....	.....	.....	1,668	146	10.7
35	1,650	27.5	750	21	3,498	368	9.5	1,732	153	11.3
33	928	.....	.....	.....	.....	.....	.....	1,301	158	8.2
31	1,064	25	530	22.5	.....	.....	.....	1,415	211	6.7
26	933	22	284	18	3,889	303	12.8	2,169	116	18.6
.....	997	.....	703	.....	2,014	127	15.8	1,376	87	15.8
27.5	1,000	22.5	.....	.....	2,886	173	16.6	1,808	90	20
31.4	1,047	23.5	706	30.5	2,070	144	14.3	1,360	101	13.4
.....	1,495	.....	.....	.....	1,163	191	6	542	95	5.7
.....	500	.....	314	.....	3,110	211	14.7	827	46	17.9
29	1,250	27	.....	.....	2,485	261	9.5	936	56	16.7
.....	725	.....	451	.....	651	172	3.7	328	75	4.3

TAB

DEGREE-CONFERRING INSTITUTIONS IN THE UNITED STATES AND CAN.
SALARIES OF TH

Institution	Total Annual Income	Annual Appropriation for Salaries of Instructing Staff	Average Salary of Professor	Average Age at Entrance to Grade of Professor	Average Salary of Associate Professor	Average Age at Entrance to Grade of Associate Professor
UNIVERSITY OF TEXAS Austin, Texas.....	\$339,577	\$199,394	\$2,889	32.5	\$2,300	..
SYRACUSE UNIVERSITY Syracuse, New York.....	279,000	180,000	1,806	.....	1,291	..
SMITH COLLEGE Northampton, Massachusetts.....	278,717	177,150	2,150	.....	.....	..
UNIVERSITY OF KANSAS Lawrence, Kansas.....	285,000	176,000	2,100	.....	1,600	..
COLLEGE OF THE CITY OF NEW YORK New York City.....	455,000	175,270	4,788	.....	3,189	..
STATE UNIVERSITY OF IOWA Iowa City, Iowa.....	324,048	173,355	2,152	37.5	.....	..
DARTMOUTH COLLEGE Hanover, New Hampshire.....	250,000	155,000	2,600	40	2,200	..
TULANE UNIVERSITY OF LOUISIANA New Orleans, Louisiana.....	274,000	146,000	3,000	35	2,000	2
IOWA STATE COLLEGE OF AGRICULTURE AND MECHANIC ARTS, Ames, Iowa.....	210,000	140,286	2,000	.....	1,600	..
WELLESLEY COLLEGE Wellesley, Massachusetts.....	438,493	136,586	1,900	.....	.....	..
VASSAR COLLEGE Poughkeepsie, New York.....	483,000	129,500	2,896	.....	.....	..
KANSAS STATE AGRICULTURAL COLLEGE Manhattan, Kansas.....	393,500	129,100	2,140	34.5	.....	..
INDIANA UNIVERSITY Bloomington, Indiana.....	215,000	129,000	2,400	35	1,707	..
PURDUE UNIVERSITY La Fayette, Indiana.....	255,000	128,920	2,200	.....	.....	..
OBERLIN COLLEGE Oberlin, Ohio.....	223,729	128,400	1,941	33	.....	..
UNIVERSITY OF CINCINNATI Cincinnati, Ohio.....	254,699	123,141	3,000	35	2,000	3
ARMOUR INSTITUTE OF TECHNOLOGY Chicago, Illinois.....	215,000	123,000	2,150	35	1,682	3
UNIVERSITY OF VIRGINIA Charlottesville, Virginia.....	202,190	122,960	3,100	35	.....	..
UNIVERSITY OF WASHINGTON Seattle, Washington.....	202,000	122,400	1,950	.....	1,700	..
WESTERN RESERVE UNIVERSITY Cleveland, Ohio.....	179,661	116,141	2,700	.....	1,880	..
AGRICULTURAL COLLEGE OF UTAH Logan, Utah.....	130,566	115,400	1,800	35	.....	..
BROWN UNIVERSITY Providence, Rhode Island.....	214,198	114,630	2,680	37	1,843	3

Continued

OPRIATING ANNUALLY \$45,000 OR OVER FOR THE TOTAL PAYMENT OF THE
 INSTRUCTING STAFFS

re of nt or	Average Age at Entrance to Grade of Assist- ant Pro- fessor	Average Salary of Instructor	Average Age at Entrance to Grade of Instruc- tor	Average Salary of Assistant	Average Age at Entrance to Grade of Assist- ant	Total Number of Stu- dents in Univers- ity	Total Instruct- ing Staff in Univers- ity	Ratio	Total Number of Stu- dents in Under- graduate Colleges and Non- profession- al Gradu- ate Schools	Total In- structing Staff in Under- graduate Colleges and Non- profession- al Gradu- ate Schools	Ratio
93		\$1,252		\$ 580		1,693	110	15.3	1,169	80	14.5
78		771		363		2,875	199	14.4	1,807	89	20.3
16		1,168	27	800	24				1,482	97	15.2
10		700		415		1,786	126	14.1	1,282	97	13.2
50		1,445		1,138							
71	32.5	832	29.5	200		1,791	149	12	1,200	86	13.9
10	32	1,300	26	900	23	1,219	88	13.8	1,161	70	16.5
10	27	800	25	400	21	1,433	148	9.6	525	55	9.5
10		600		400					1,098	108	10.1
50		1,000							1,209	118	10.2
10		1,000							996	81	12.2
35	32	1,080	28.5	867	24.5				1,034	69	14.9
10	33	972	30	229							
10		1,000		600		1,713	124	13.8	1,605	119	13.4
50		850	28.5			1,406	109	12.8	803	44	18.2
10	30	900	28	200	25	994	120	8.2	638	52	12.2
28	28	1,140	27	900	26				622	62	10
25	26	475	24	250	21	785	91	8.6	467	61	7.6
50		1,200		265		1,061	72	14.7	907	64	14.1
10		1,000		650		914	155	5.8	566	53	10.6
10	30	1,000	24	650	22				530	55	9.6
19	30	734	26	388	22				924	81	11.4

TABLE

DEGREE-CONFERRING INSTITUTIONS IN THE UNITED STATES AND CANADA
SALARIES OF THE FACULTY

Institution	Total Annual Income	Annual Appropriation for Salaries of Instructing Staff	Average Salary of Professor	Average Age at Entrance to Grade of Professor	Average Salary of Associate Professor	Average Age Entering to Grade of Associate Professor
WASHINGTON UNIVERSITY Saint Louis, Missouri.....	\$158,051	\$114,034	\$2,471	.....	.....	...
WEST VIRGINIA UNIVERSITY Morgantown, West Virginia.....	200,000	110,000	2,080	35	\$1,600	30
MICHIGAN STATE AGRICULTURAL COLLEGE Lansing, Michigan.....	325,000	110,000	2,300	34	2,000	34
LEHIGH UNIVERSITY South Bethlehem, Pennsylvania.....	166,500	107,000	2,137	30	.....	...
BRYN MAWR COLLEGE Bryn Mawr, Pennsylvania.....	126,808	106,687	2,500	.....	2,000	...
TUFTS COLLEGE Tufts College, Massachusetts.....	180,000	104,600	1,870	.....	.....	...
GEORGE WASHINGTON UNIVERSITY Washington, D.C.....	189,643	101,610	1,693	32.5	.....	...
PENNSYLVANIA STATE COLLEGE State College, Pennsylvania.....	251,920	97,190	2,010	.....	.....	...
UNIVERSITY OF COLORADO Boulder, Colorado.....	175,000	95,000	2,050	32	.....	...
WILLIAMS COLLEGE Williamstown, Massachusetts.....	168,000	95,000	2,714	32	2,100	32
CLEMSON AGRICULTURAL COLLEGE Clemson College, South Carolina.....	271,720	93,650	2,100	.....	1,800	...
UNIVERSITY OF UTAH Salt Lake City, Utah.....	156,000	85,653	1,881	.....	1,900	...
AMHERST COLLEGE Amherst, Massachusetts.....	133,214	85,500	2,853	36	1,700	...
VANDERBILT UNIVERSITY Nashville, Tennessee.....	169,000	83,000	2,800	.....	1,900	...
BOSTON UNIVERSITY Boston, Massachusetts.....	186,484	82,340	2,419	35	.....	...
MOUNT HOLYOKE COLLEGE South Hadley, Massachusetts.....	225,000	81,000	1,350	40	.....	...
STATE COLLEGE OF WASHINGTON Pullman, Washington.....	130,000	80,000	1,750	35	1,700	30
UNIVERSITY OF TENNESSEE Knoxville, Tennessee.....	153,877	78,000	2,000	39	1,600	32
WESTERN UNIVERSITY OF PENNSYLVANIA Pittsburgh, Pennsylvania.....	137,139	76,617	1,864	38	.....	...
AGRICULTURAL AND MECHANICAL COLLEGE OF TEXAS College Station, Texas.....	160,000	74,000	2,000	.....	.....	...
UNIVERSITY OF NORTH CAROLINA Chapel Hill, North Carolina.....	104,121	72,326	1,975	.....	.....	...
STATE UNIVERSITY OF OKLAHOMA Norman, Oklahoma.....	110,000	72,274	1,800	.....	.....	...

II—Continued

APPROPRIATING ANNUALLY \$45,000 OR OVER FOR THE TOTAL PAYMENT OF THE INSTRUCTING STAFFS

Average Salary of Assistant Professor	Average Age at Entrance to Grade of Assistant Professor	Average Salary of Instructor	Average Age at Entrance to Grade of Instructor	Average Salary of Assistant	Average Age at Entrance to Grade of Assistant	Total Number of Students in University	Total Instructing Staff in University	Ratio	Total Number of Students in Undergraduate Colleges and Non-professional Graduate Schools	Total Instructing Staff in Undergraduate Colleges and Non-professional Graduate Schools	Ratio
\$1,400		\$893				1,124	174	6.4	331	45	7
1,350	30	1,000	27.5	\$650		667	62	10.7	284	41	6
1,200	29	825	25	300	25				683	78	8
1,537	27	1,027	24	583	23				674	57	11
1,500		1,000		900					362	47	7
1,375		875		140		1,083	198	5.4	453	45	10
1,094	27.5	606	25	650	22.5	1,258	196	6.4	643	82	7
1,390		990		646					784	81	9
1,400	30	800	24	300	22	840	112	7.5	726	57	12
1,730	28	1,045	25	775	23				475	58	8
1,400		1,100		850					658	41	16
1,700		950		200		565	50	11.3	390	39	10
1,566		1,225							513	38	13
1,400		1,000		450		902	110	8.1	342	44	7
1,628	28	708	25			1,428	150	9.5	519	34	15
1,100	30	950	25	450	22				711	87	8
1,400		1,000	25	500	23				1,100	65	16
1,300	28	1,000	25	250	24	694	106	6.5	353	34	10
		999	27			966	144	6.7	187	23	8
1,300		1,100							623	52	11
1,242		732		143		731	73	10	483	48	10
1,400		1,350		450		394	36	10.9	201	28	7

TABLE

**DEGREE-CONFERRING INSTITUTIONS IN THE UNITED STATES AND CANADA
SALARIES OF THEIR**

Institution	Total Annual Income	Annual Appropriation for Salaries of Instructing Staff	Average Salary of Professor	Average Age at Entrance to Grade of Professor	Average Salary of Associate Professor	Average Age at Entrance to Grade of Associate Professor
CLARK UNIVERSITY Worcester, Massachusetts.....	\$145,000	\$70,000	\$3,000	.....	.....	.....
STEVENS INSTITUTE OF TECHNOLOGY Hoboken, New Jersey.....	108,000	69,000	3,200	.....	.....	.....
UNIVERSITY OF MAINE Orono, Maine.....	135,000	69,357	1,800	34	\$1,500	30
DRAKE UNIVERSITY Des Moines, Iowa.....	101,856	67,849	1,500	32	.....	.....
MIAMI UNIVERSITY Oxford, Ohio.....	113,000	66,300	2,000	.....	1,650	.....
OHIO WESLEYAN UNIVERSITY Delaware, Ohio.....	165,000	66,000	1,800	.....	1,300	.....
STATE UNIVERSITY AND SCHOOL OF MINES OF NORTH DAKOTA, University, North Dakota.....	153,136	65,500	2,200	35	.....	.....
WESLEYAN UNIVERSITY Middletown, Connecticut.....	123,000	65,000	2,575	33	.....	.....
ALABAMA POLYTECHNIC INSTITUTE Auburn, Alabama.....	92,000	65,000	2,000	.....	1,700	.....
WORCESTER POLYTECHNIC INSTITUTE Worcester, Massachusetts.....	89,594	61,107	2,369	.....	.....	.....
SIMMONS COLLEGE Boston, Massachusetts.....	127,024	61,000	2,900	.....	2,266	.....
COLGATE UNIVERSITY Hamilton, New York.....	114,532	60,930	1,740	.....	.....	.....
VIRGINIA POLYTECHNIC INSTITUTE Blacksburg, Virginia.....	118,000	60,764	1,980	33	.....	.....
CASE SCHOOL OF APPLIED SCIENCE Cleveland, Ohio.....	145,500	60,205	2,861	32.5	.....	.....
OHIO UNIVERSITY Athens, Ohio.....	165,000	60,160	1,900	25	1,600	25
UNION UNIVERSITY Schenectady, New York.....	110,126	60,159	2,300	35	.....	.....
UNIVERSITY OF VERMONT Burlington, Vermont.....	105,000	60,000	2,100	35	1,650	30
RENSSELAER POLYTECHNIC INSTITUTE Troy, New York.....	110,400	58,721	3,300	25	2,500	35
HOWARD UNIVERSITY Washington, D.C.....	91,555	58,619	1,837	32.5	.....	.....
QUEEN'S UNIVERSITY Kingston, Ontario.....	88,221	58,351	2,000	.....	.....	.....
UNIVERSITY OF MISSISSIPPI University, Mississippi.....	105,000	57,300	2,000	.....	1,325	.....
UNIVERSITY OF SOUTH DAKOTA Vermilion, South Dakota.....	80,000	56,000	1,650	.....	.....	.....

II—Continued

APPROPRIATING ANNUALLY \$45,000 OR OVER FOR THE TOTAL PAYMENT OF THE INSTRUCTING STAFFS

Average Salary of Assistant Professor	Average Age at Entrance to Grade of Assistant Professor	Average Salary of Instructor	Average Age at Entrance to Grade of Instructor	Average Salary of Assistant	Average Age at Entrance to Grade of Assistant	Total Number of Students in University	Total Instructing Staff in University	Ratio	Total Number of Students in Undergraduate Colleges and Non-professional Graduate Schools	Total Instructing Staff in Undergraduate Colleges and Non-professional Graduate Schools	Ratio
\$1,650	.....	\$ 1,050	.....	\$ 600	.....	.....	.....	.....	159	37	.....
2,000	29	1,300	23	850	37.5	.....	.....	.....	429	42	10
1,200	27.5	800	24	300	23	702	74	9.4	514	50	10
1,000	28	800	25	500	23	866	93	9.3	515	20	26
1,150	.....	700	.....	.....	.....	570	41	13.9	313	28	11
850	.....	700	.....	50	.....	1,178	119	9.8	580	43	13
1,550	30	988	25	.....	.....	425	49	8.6	230	30	7
1,750	30	1,080	28	575	23	.....	.....	.....	316	29	10
1,500	.....	850	.....	250	.....	.....	.....	.....	543	50	10
1,725	.....	953	.....	.....	.....	.....	.....	.....	465	46	10
1,660	.....	1,054	.....	500	.....	.....	.....	.....	545	59	9
1,500	.....	1,300	.....	466	.....	.....	.....	.....	287	24	11
1,260	30	800	25	250	21	.....	.....	.....	577	57	10
1,443	27.5	989	23.5	.....	.....	.....	.....	.....	440	40	11
900	23	750	23	700	21	1,224	38	32.2	414	21	19
1,400	28	1,130	24	.....	.....	627	108	5.7	270	33	8
1,375	28	800	25	325	23	497	65	7.6	345	37	9
1,800	29	1,500	29	1,200	24	.....	.....	.....	485	29	16
1,000	.....	750	.....	400	.....	785	92	8.5	265	17	10
1,200	.....	1,000	.....	.....	.....	1,134	80	14.1	914	48	19
1,000	.....	.....	.....	750	.....	344	28	12.2	274	24	11
1,100	.....	650	.....	200	.....	359	44	8.1	173	18	9

TABLE

DEGREE-CONFERRING INSTITUTIONS IN THE UNITED STATES AND CANADA
SALARIES OF THEIR

Institution	Total Annual Income	Annual Appropriation for Salaries of Instructing Staff	Average Salary of Professor	Average Age at Entrance to Grade of Professor	Average Salary of Associate Professor	Average Age at Entrance to Grade of Associate Professor
SWARTHMORE COLLEGE Swarthmore, Pennsylvania.....	\$84,000	\$55,335	\$2,100	.....	.....	.....
GEORGIA SCHOOL OF TECHNOLOGY Atlanta, Georgia.....	82,500	55,000	1,945	.....	.....	1,200
UNIVERSITY OF IDAHO Moscow, Idaho.....	99,639	54,920	1,800	.....	.....	.....
TEMPLE COLLEGE Philadelphia, Pennsylvania.....	72,895	54,272	1,500	35	.....	.....
RADCLIFFE COLLEGE Cambridge, Massachusetts.....	90,000	53,000	1	.....	.....	.....
RUTGERS COLLEGE New Brunswick, New Jersey.....	87,000	53,000	2,300	.....	.....	.....
NORTH DAKOTA AGRICULTURAL COLLEGE Fargo, North Dakota.....	114,000	52,150	2,000	30	.....	.....
WASHINGTON AND LEE UNIVERSITY Lexington, Virginia.....	70,000	50,000	2,600	35	.....	.....
STATE UNIVERSITY OF KENTUCKY Lexington, Kentucky.....	90,247	49,250	2,000	33	.....	.....
JAMES MILLIKIN UNIVERSITY Decatur, Illinois.....	64,003	49,160	1,400	30	.....	.....
NORTH CAROLINA COLLEGE OF AGRICULTURE AND MECHANIC ARTS , West Raleigh, N. Carolina....	114,000	49,000	2,000	30	.....	.....
MONTANA STATE COLLEGE OF AGRICULTURE AND MECHANIC ARTS , Bozeman, Montana.....	133,000	48,650	1,800	.....	.....	.....
UNIVERSITY OF OREGON Eugene, Oregon.....	60,000	47,927	1,800	40	.....	.....
HAVERFORD COLLEGE Haverford, Pennsylvania.....	78,650	45,300	3,440	35	.....	.....
UNIVERSITY OF ROCHESTER Rochester, New York.....	60,334	45,000	2,383	.....	.....	.....

1 Not including Medical School.

2 Including the preceptors as assistant professors.

3 Including payments of students for board.

4 Most of the Faculty receive a small extra compensation for teaching at the Women's College.

5 Faculty consists of members of the Faculty of Harvard University, paid a certain amount per course.

6 Law students are not classified separately from collegiate undergraduates.

7 A combination of the average salary of associates, \$1,469, and the average salary of instructors, \$1,050.

8 Professors who are heads of departments receive on an average \$5,800.

I—Continued

APPROPRIATING ANNUALLY \$45,000 OR OVER FOR THE TOTAL PAYMENT OF THE INSTRUCTING STAFF

Average Salary of Assistant Professor	Average Age at Entrance to Grade of Assistant Professor	Average Salary of Instructor	Average Age at Entrance to Grade of Instructor	Average Salary of Assistant	Average Age at Entrance to Grade of Assistant	Total Number of Students in University	Total Instructing Staff in University	Ratio	Total Number of Students in Undergraduate Colleges and Non-professional Graduate Schools	Total Instructing Staff in Undergraduate Colleges and Non-professional Graduate Schools	Ratio
\$1,400		\$1,000		\$500					332	36	9
1,000		700							562	42	13
1,581		1,062							231	28	8
		600	22.5			2,343	198	11.8	199	31	6
1,600		1,425		850					255	34	7
1,300	24	1,060	22	500	22				820	33	24
1,500		350		100		468	35	13.3	385	32	12
1,200	32			800	24				466	43	10
1,000	25	550	22	250	20				231	32	7
1,240	25	786	25	367	23						
1,500		1,100		300					291	32	9
1,400	35	1,000	27	600	25	570	87	6.5	340	34	10
2,240	28	1,220	24	200	22				143	22	6
1,750		1,050		500					340	21	16

TABLE III
SUMMARY OF AVERAGE SALARIES IN 102 INSTITUTIONS

Each number in the column headed "Professorship" gives the number of institutions reporting as a professor's average salary the amount opposite that number in the "Scale for Salaries." The column thus reads: "One institution gives an average salary of from \$1,300 to \$1,399; one institution gives an average salary of from \$1,400 to \$1,499," etc.

Each number in the columns headed "Associate Professorship," "Assistant Professorship," and "Instructorship," gives a similar record in the case of these grades.

SCALE FOR ANNUAL SALARIES	PROFESSORSHIP	* ASSOCIATE PROFESSORSHIP	ASSISTANT PROFESSORSHIP	INSTRUCTORSHIP
\$300-\$399	..	..	..	1
400- 499	..	..	..	1
500- 599	..	..	..	2
600- 699	..	..	..	4
700- 799	..	..	..	12
800- 899	..	..	1	12
900- 999	..	..	2	13
1000-1099	..	..	6	29
1100-1199	..	..	3	8
1200-1299	..	2	11	6
1300-1399	1	2	14	4
1400-1499	1	..	14	5
1500-1599	2	1	13	1
1600-1699	2	9	10	1
1700-1799	2	5	9	..
1800-1899	12	3	8	1
1900-1999	7	2	..	..
2000-2099	14	6	3	..
2100-2199	9	4	..	..
2200-2299	3	3	4	..
2300-2399	6	2	..	..
2400-2499	3	..	1	..
2500-2599	2	..	..	..
2600-2699	4	..	..	..
2700-2799	4	1	1	..
2800-2899	6	1	..	..
2900-2999	2	..	..	..
3000-3099	4	..	..	..
3100-3199	4	1	..	..
3200-3299	2	..	..	..
3300-3399	1	..	..	..
3400-3499	1	..	..	..
3500-3599	2	..	..	..
3600-3699	2	1	..	..
3700-3799	..	..	..	..
3800-3899	..	..	..	..
3900-3999	..	..	..	..
4000-4099	1	..	..	..
4100-4199	..	..	..	..
4200-4299	1	..	..	..
4300-4399	..	..	..	..
4400-4499	1	..	..	..
4500-4599	..	..	..	..
4600-4699	..	..	..	..
4700-4799	1	..	..	..

* The grade of associate professor is only given when there is also the distinct grade of assistant professor in the same institution; otherwise the associate professor is classed throughout this discussion as an assistant professor.

The average salary of a full professorship as shown by Table II ranges from \$1,350 to \$4,788, but there are only eight institutions paying an average salary of less than \$1,800 to the full professor,* and also only eight institutions giving an average salary of \$3,500 or over.† Thirty-five institutions pay between \$1,700 and \$2,100. Forty-seven institutions pay between \$2,100 and \$3,200. The most common average salary is one between \$2,000 and \$2,100, found in fourteen institutions. Half of the institutions give less than \$2,200. Allowing for the varying numbers of professors in the different institutions, the average salary of a professor in the hundred strongest colleges and universities of America may be safely taken to be close to \$2,500. The most frequent salary will be lower.

The earnings of college and university teachers are not quite so meagre as the figures in this table indicate. Often the college salaries do not represent payment for all the time and energy of the teacher. In schools of science there are considerable opportunities for a professor to increase his salary by fees for expert service. To obtain such figures in detail is impossible. In an engineering school in a large city many professors double their income through outside work. In engineering schools not located in a great city, the outside earnings of the professors would probably be considerably less. In chemistry the opportunities to do expert work, while large, are probably much less than in engineering. In physics they are less than in chemistry; in astronomy they are practically nil. Each branch of science will be affected by its own peculiar conditions and these again influenced by the environment of the institution.

The professors in the so-called "academic" subjects do, in numerous instances, add to their college salaries, but in nothing like the proportion of the professors in the schools of science and in the professional schools. They frequently engage in editorial and literary work, and a few teachers who hold editorial positions with large publishing houses or who have written text-books of national repute possess large outside incomes. It may be remarked, however, that these men generally have the unusual energy or the practical sagacity and

* These eight are:

1. Mount Holyoke College.....	\$1,350	5. University of South Dakota....	1,650
2. James Milliken University.....	1,400	6. George Washington University..	1,693
3. Drake University.....	1,500	7. Colgate University.....	1,740
4. Temple College.....	1,500	8. State College of Washington.....	1,750

† These eight institutions are:

1. College of the City of New York....	\$4,788
2. Harvard University.....	4,413
3. Columbia University.....	4,289
4. Leland Stanford Junior University..	4,000
5. University of Chicago.....	3,600
6. University of Toronto.....	3,600
7. Yale University.....	3,500
8. University of Pennsylvania.....	3,500
also The General Theological Seminary..	4,000 and a residence

initiative that would raise their regular income, no matter what profession or business they made their life work.

The policy of institutions toward the permission of outside work by professors varies. Such participation in practice by professors of engineering and applied science has many advantages for the institution, for students, and for the public. On the other hand, in the case of many teachers the outside work comes to outweigh in importance the regular work of teaching. As a consequence, the teaching depreciates and students suffer. How to steer between a fair participation in practice and full justice to the work of the teacher is one of the difficult problems in engineering education. However advantageous it may be for a professor to engage in outside expert work, this should be, like his private research, an opportunity which he can accept or decline according to his judgment. Extra-university employment should never be forced upon teachers by a salary schedule arranged upon a part time basis. College and university teaching is sufficient to employ to its full capacity the energy of a single mind. The best law schools have accepted this fact. Medical schools will in the future adopt the same plan for the majority of their professors. For the college departments and the graduate schools of a university to entrust the instruction of their students to professors or instructors who are compelled to give to teaching only part of their ability and attention, is an unwise policy. The students must inevitably suffer.

The age at which a man may reasonably expect to attain to a certain salary should always be considered in estimating that salary. Unfortunately, the answers in regard to the average age of appointment to the several academic grades have frequently been neglected by the college authorities and even when given have often been vague. From such replies as have been received, however, there will be given, a little farther on, the average age of entrance to the different groups of salaries. Considering here the title of professor by itself, irrespective of the salary attached, it appears from the fifty-five institutions giving answers on this point, that the range of appointment to a full professorship is from thirty to forty years inclusive. An average of thirty-five years is the most frequent case, with averages from thirty to thirty-five years occurring nearly three times as often as averages from thirty-five to forty years. The average of the averages reported for all the institutions is thirty-four years.

It would therefore appear that for the hundred American colleges and universities making the largest total expenditure for teachers' salaries, the average salary of the full professor is almost \$2,500, and the appointment to a full professorship takes place, usually, when the teacher is thirty-four years old.

To compare these facts with the conditions prevailing in other professions is extremely difficult. It might be possible to arrive at the average income of the lawyer, the physician, and the engineer at the age of thirty-four, but such

an average, representing all lawyers, all physicians, and all engineers, would be of no value for the purpose of comparison with the college professor. The college professor in these one hundred institutions, if we consider both salary and dignity, is the successful man in his profession. He is the teacher who with the advantages of good character and industry has far more than the average teacher's ability. He cannot therefore be compared with all the men, whatever their moral and mental equipment and their powers and habits of application, who enter into some other given profession. The college professor must be compared with such lawyers, such physicians, and such engineers as have done as well in their professions as the college professor has in his.

The kind of men in the other professions who can be compared profitably with the college professor and what is the average income of the professional men so selected for comparison, is something which cannot be worked out exactly. The best that can be done is to obtain the opinion of competent judges and this the Foundation has endeavored to do. It seemed to be the opinion of competent men that the average good lawyer and good engineer, after being out of the professional school about eight or ten years, would be earning in New York between four and five thousand dollars a year. The physician of a similar character and age, it was estimated by distinguished medical authorities, would be earning somewhat more. As the figures for the legal and engineering professions were net and those for the medical gross, the estimates for the three approximated closely. The physician's house rent and similar personal expenditures correspond, in part, to the lawyer's office rent and office expenses. The full professor at Columbia receives on an average \$4,289. At the College of the City of New York the average salary of the full professor is \$4,788, but while the City College is an enormous institution, with about four thousand students, there are only twelve full professors. These professors can hardly be regarded as equal to the average professor in other institutions. They are heads of large departments and compare with the professors in other colleges who receive the maximum compensation. At the Stevens Institute of Technology in Hoboken the average salary of the full professor is \$3,200; at the Polytechnic Institute of Brooklyn it is \$2,783. At the General Theological Seminary each of the seven professors receives \$4,000 and a residence in Chelsea Square. These latter professors, it should be noted, must be classed with the full professors in law and medical schools giving all of their time to the work of teaching. Such professors always receive higher salaries than their colleagues in the non-professional departments.

It would seem as if, in New York City, the better type of lawyer, of physician, and of engineer received at thirty-four a larger income from his profession than the salary paid to the full professor in the institutions of higher learning. The balance in favor of the outside professional man is not however so great as to indicate striking injustice to the college professor. The figures for New York

will probably be true also on a sliding scale for the rest of the country. As we pass to the other large cities and finally to the small college towns, the salaries of the professors decrease and the income of the professional men also. Probably the same proportion is observed; the good local lawyer and physician earning at thirty-four more than the professor at the college, but not very much more.

When the teacher at the average age of thirty-four has been elected to a full professorship in a college or university, he has however practically reached the limit of his earning power, at least in that institution. The successful professional man on the other hand is just beginning to reap the substantial rewards of his ability and his training. The professor, in the vast majority of cases, stays at his average salary of \$2,500, while his intellectual brother in the law, in medicine, and in scientific occupations rises steadily in the large cities to ten, twenty, thirty thousand dollars a year, and in smaller towns to incomes, not so large actually, but relatively large in proportion to the scale of living. This age of thirty-four, the age at which the professor's salary begins to stand still and the outside professional man's to advance rapidly, is just the age, it must also be remembered, when as a rule heavy expenditure for children's education begins.

It will not be unfair, in addition, to consider the maximum rewards which are possible in college teaching and to make comparison. Men are ever affected powerfully by the potentialities of a calling, even when the number who can grasp the prizes are few. A young man of ability in choosing a career is apt to think more of the half dozen great rewards at the top than the safe returns assured to ordinary success. The outside stimulus to the work of a superior man is the possibilities for him, not the actualities for all. Every young English law student imagines himself in the velvet and fur of the Lord Chancellor, just as every midshipman at Annapolis dreams of himself as a future Admiral of the Navy. No one would wish human nature to be otherwise. But in college teaching the attractive prizes, at least in money, do not exist. Of the one hundred institutions having annual budgets for teachers' salaries of over \$45,000, only thirty-eight announce a maximum salary equal to three thousand five hundred dollars. Two institutions with a smaller budget have equally large maxima,* but it is certain that there are not over sixty institutions for higher education in America whose professors may hope to receive a salary equal to that of the superintendent of schools of such cities as Athens, Ohio, and Fort Wayne, Indiana, and to the income received by fairly successful commercial travellers or superintendents of small factories.

Except by elevation to the presidency of one of the great universities, the utmost limit of expectation of a college professor in salary is eight thousand

* The General Theological Seminary . . . \$4,000 and a residence
Polytechnic Institute of Brooklyn 4,000

dollars. This is below the limits set to professors' incomes in Germany. In that country the income from students' fees and from perquisites in the form of outside state appointments raise the salary of a gifted man, notwithstanding the difference in the cost of living, to at least double the American limit. In only five institutions in America is the possibility for a professor greater than five thousand five hundred dollars. Four of these institutions are universities located in New York, Boston, Chicago, and Philadelphia. In these four cities a lawyer, a physician, or an engineer does not have to attain extraordinary eminence to receive several times the salary which is the utmost hope of the college teacher. Good, plodding men, who attend diligently to their profession but who are without unusual ability, often obtain in middle life an income considerably higher than a man of the greatest genius can receive in an American professor's chair.

The presidency of a great university demands talent and administrative skill of a very high order. The salaries are not much above the upper range of what a professor may receive. In the great cities of the country the really great lawyers earn from sixty to one hundred thousand dollars a year. The prevalent opinion seems to be that the physicians and surgeons of great eminence and reputation receive from fifty to one hundred thousand dollars a year. Exceptional years occur when even these figures are exceeded by the leaders of the professions. It must be considered what effect these facts, not to speak of the fortunes possible to business skill, have upon the high-spirited youth about to choose a life work. If he selects college or university teaching the utmost limit he can hope for will be the financial success attained by the average man of his class who chooses the other professions. In other callings great ability brings a proportionate reward; the best man may expect from twenty to forty times the reward of the average man. In industry and business the best man may expect from two hundred to four hundred times the reward of the average man. But in teaching and scholarship the best man cannot, under present conditions, expect much more than from two to four times the financial reward of the average man. No matter how great the ability of the college professor as a teacher or scholar, there is no working probability that he will ever be paid more than a minor officer of a railroad or industrial company.

It is not strange that the possibility of teaching seldom presents itself seriously nowadays to the best students in a large graduating class. That gifted men do enter the profession of teaching is due solely to the love of teaching, study, and research. The fiscal arrangements of the profession of college teaching are just such as would attract a mediocre person who did not expect that in any other activity the world held out to him very much. The need for larger prizes is pressing.

Below is a table giving the institutions which announce a maximum professor's salary of three thousand dollars or over. In this table house rent

when given as a part of the salary is counted at from \$600 to \$1,400 according to the relevant facts.

TABLE IV
MAXIMUM SALARIES

INSTITUTIONS ANNOUNCING A MAXIMUM PROFESSOR'S SALARY OF \$5,500 OR OVER:

Columbia University.....	New York, New York
Cornell University.....	Ithaca, New York
Harvard University.....	Cambridge, Massachusetts
University of Chicago.....	Chicago, Illinois
University of Pennsylvania.....	Philadelphia, Pennsylvania

INSTITUTIONS ANNOUNCING A MAXIMUM PROFESSOR'S SALARY OF FROM \$4,500 UP TO \$5,500:

College of the City of New York.....	New York, New York
General Theological Seminary	New York, New York
George Washington University.....	Washington, D. C.
Haverford College.....	Haverford, Pennsylvania
Johns Hopkins University.....	Baltimore, Maryland
Leland Stanford Junior University.....	Stanford University, California
Northwestern University.....	Evanston, Illinois
Tulane University of Louisiana.....	New Orleans, Louisiana
University of California.....	Berkeley, California
University of Illinois.....	Urbana-Champaign, Illinois

INSTITUTIONS ANNOUNCING A MAXIMUM PROFESSOR'S SALARY OF FROM \$3,500 UP TO \$4,500:

Clark University.....	Worcester, Massachusetts
McGill University.....	Montreal, Quebec
Massachusetts Institute of Technology.....	Boston, Massachusetts
New York University	New York, New York
Polytechnic Institute of Brooklyn.....	Brooklyn, New York
Princeton University.....	Princeton, New Jersey
Rensselaer Polytechnic Institute.....	Troy, New York
Rutgers College.....	New Brunswick, New Jersey
Stevens Institute of Technology.....	Hoboken, New Jersey
University of Cincinnati.....	Cincinnati, Ohio
University of Michigan.....	Ann Arbor, Michigan
University of Minnesota.....	Minneapolis, Minnesota
University of Missouri	Columbia, Missouri
University of Texas.....	Austin, Texas
University of Toronto.....	Toronto, Ontario
University of Wisconsin.....	Madison, Wisconsin
Washington University.....	Saint Louis, Missouri
Wesleyan University.....	Middletown, Connecticut
Yale University.....	New Haven, Connecticut

INSTITUTIONS ANNOUNCING A MAXIMUM PROFESSOR'S SALARY OF FROM \$3,000 UP TO \$3,500:

Adelphi College.....	Brooklyn, New York
Amherst College.....	Amherst, Massachusetts
Armour Institute of Technology.....	Chicago, Illinois
Boston University.....	Boston, Massachusetts
Brown University.....	Providence, Rhode Island
Bryn Mawr College.....	Bryn Mawr, Pennsylvania
Case School of Applied Science	Cleveland, Ohio
Colorado School of Mines.....	Golden, Colorado
Dartmouth College.....	Hanover, New Hampshire
Drury College.....	Springfield, Missouri
Lehigh University.....	South Bethlehem, Pennsylvania

TABLE IV—*Continued*

INSTITUTIONS ANNOUNCING A MAXIMUM PROFESSOR'S SALARY OF FROM \$3,000 UP TO \$3,500

Massachusetts Agricultural College.....	Amherst, Massachusetts *
North Carolina College of Agriculture and Mechanic Arts.....	West Raleigh, North Carolina
Pennsylvania State College.....	State College, Pennsylvania
Ripon College.....	Ripon, Wisconsin
Rochester Theological Seminary.....	Rochester, New York
Saint Louis University.....	Saint Louis, Missouri
Simmons College.....	Boston, Massachusetts
Smith College.....	Northampton, Massachusetts
State University of Iowa.....	Iowa City, Iowa
Swarthmore College.....	Swarthmore, Pennsylvania
Trinity College.....	Hartford, Connecticut
Union University.....	Schenectady, New York
University of Nashville.....	Nashville, Tennessee
University of Rochester.....	Rochester, New York
University of Virginia.....	Charlottesville, Virginia
Vanderbilt University.....	Nashville, Tennessee
Vassar College.....	Poughkeepsie, New York
Western Reserve University.....	Cleveland, Ohio
Western University of Pennsylvania.....	Pittsburgh, Pennsylvania
Williams College.....	Williamstown, Massachusetts
Worcester Polytechnic Institute.....	Worcester, Massachusetts

Before drawing any minute or final conclusions from such a list, one should know not only the announced maximum, but also the conditions of its attainment and especially the number of professors who actually receive it. The maximum may be limited to one professional school, or to deans, or to heads of departments. For instance, Columbia University has a maximum salary of \$8,000, but an average salary for full professors of \$4,289. Evidently the maximum must be rare. In the case of Columbia University, in fact, the maximum represents not what an entirely satisfactory professor working in the prime of life may expect, but what a very few men retain as a result of a fiscal policy once in force but long discontinued. In the University of Chicago, again, the maximum of \$7,000 is not a maximum for a professor, but a maximum for a professor who is also a head of a department. The maximum for a professor is announced as \$4,500.

Comparisons between particular institutions will therefore be helpful only if made from more detailed study of the institutions than the present data afford. It is certain that there is a great difference in administrative policy in this respect. Some institutions adhere very closely to the practice of not setting a maximum higher than their financial prospects allow them to expect to give to every competent man who holds a professorship on to maturity. Others set maxima which they can give, or at least do give, to very few individuals. The General Theological Seminary, Dartmouth College, Lafayette College, the University of South Carolina, and the University of the South are instances of maxima to which every professor is certain or almost certain to attain. Haver-

* Salaries over \$2,500 are, however, due to very special circumstances.

ford College, Tulane University, and Wesleyan University are instances where a few well-known professors may receive high salaries.

The former method has the advantage of letting a member of the staff know absolutely what he may expect from his institution, provided his work is satisfactory. It will, so far as the amount of salary decides the professor's choice between positions, tend to bring about a uniformity of ability within an institution and a clearer gradation of institutions with respect to the ability of their teaching staffs. A low *average* salary does not, of course, prevent an institution from retaining an eminent teacher, but a low *maximum* will always tend to do so. Whether this evenness of ability within an institution is as healthy as a moderate variation is questionable. Two other results of the policy are almost certainly bad. First, it works injustice to some individuals. A good man becomes attached to an institution by loyal affection; to work well he needs to feel that his home, his friends, and his career are to be in that place; there is a real waste involved in his moving from one institution to another. His best qualities thus make him suffer a pecuniary loss. In the second place, the administrative authorities will rarely be entirely consistent. When the most gifted men on the staff are offered financially better positions elsewhere, the president will be tempted to reduce the amount of teaching required of the professor as a substitute for the advance in salary which the fixed policy denies. The result may be that the most gifted men come in contact with the fewest students, that the man whose work is worth most to the college does the least work for it.

The method of offering a few unusual salaries to the few unusual men has the advantage of flexibility, such as the differences between individuals in the quality and quantity of work done for an institution theoretically demand. It seems more likely to operate to raise the conventional maxima than does the former method, and while it may be less likely to improve the conventions in respect to average salaries, it would tend greatly if adopted by a number of prominent institutions, to put teaching on a level of attractiveness and dignity with the other professions. The present finances of a college or university may forbid an increase of a thousand or fifteen hundred dollars to every professor's salary, but they will nearly always permit one salary being increased five or ten thousand dollars.

Although the study of the hundred strongest colleges and universities of the United States and of Canada probably gives more trustworthy results than to consider every institution which chooses to call itself a college or university, nevertheless it will not be without value to consider in addition all of the degree-conferring corporations in the American English-speaking countries. In Table V are given the figures for all the institutions making a definite statement in regard to the salary paid to the full professor.

TABLE V
SUMMARY OF AVERAGE SALARIES OF FULL PROFESSORS IN AMERICAN
COLLEGES

NUMBER OF INSTITUTIONS	AVERAGE SALARY OF FULL PROFESSOR	NUMBER OF INSTITUTIONS	AVERAGE SALARY OF FULL PROFESSOR
1	\$ 200-\$ 299*	6	\$2,700-\$2,799
9	300- 399	6	2,800- 2,899
15	400- 499	3	2,900- 2,999
17	500- 599	4	3,000- 3,099
29	600- 699	4	3,100- 3,199
28	700- 799	2	3,200- 3,299
25	800- 899	1	3,300- 3,399
30	900- 999	1	3,400- 3,499
40	1,000-1,099	2	3,500- 3,599
29	1,100-1,199	2	3,600- 3,699
35	1,200-1,299	0	3,700- 3,799
15	1,300-1,399	0	3,800- 3,899
17	1,400-1,499	0	3,900- 3,999
22	1,500-1,599	1	4,000- 4,099
16	1,600-1,699	0	4,100- 4,199
12	1,700-1,799	1	4,200- 4,299
26	1,800-1,899	0	4,300- 4,399
7	1,900-1,999	1	4,400- 4,499
22	2,000-2,099	0	4,500- 4,599
10	2,100-2,199	0	4,600- 4,699
7	2,200-2,299	1	4,700- 4,799
8	2,300-2,399	0	4,800- 4,899
4	2,400-2,499	0	4,900- 4,999
4	2,500-2,599	1	5,000†
7	2,600-2,699		

The range of these averages is very great. Even allowing for the lowering effect of part-time teachers upon an institution's average and for failures to report board and lodging given in addition to the cash salary, it cannot be doubted that the degree-giving institutions vary from an average provision for the full professor of from less than \$500 a year up to \$4,788. Ninety-seven institutions pay an average of \$2,000 or over; only forty-six pay an average of \$2,500 or over; only twenty pay an average of \$3,000 or over; and as noted before only nine pay an average of \$3,500 or over.

About a third of the American colleges and universities report an average salary to a full professor of less than \$1,000 and not quite half report an average salary of more than \$1,000 but less than \$2,000.

Associate professor, adjunct professor, assistant professor, and preceptor

* The lower salaries may be added to in some cases by board and lodging given, but not reported.

† This is in a sense too low, the average salary being \$4,000 and an excellent house in New York City. But the professor would probably not feel free to let the house. (The General Theological Seminary.)

are grades below that of the full professor, yet entitling the holders to seats in the faculty. These different grades are not sharply defined. Forty-three of the institutions we are considering in Table II report both the grades of associate professor and assistant professor; the rest have only one grade of professor below the possessor of the full professorial title. In some of these latter cases the professor of lower rank is called an associate or adjunct professor. But in the above table we have only considered a professor to be an associate professor when in addition to that rank there is also in the same institution the distinct grade of assistant professor. When an institution has only one such lower professorial grade, it is grouped as an assistant professorship.

For the grade of associate professors the range is more limited than for a full professorship, the lowest average being \$1,200 (Georgia School of Technology) and the highest \$3,400 (Harvard University). There are only five institutions of the forty reporting this grade which pay to it \$1,500 * or less and only four which give it over \$2,500.† Two-thirds of the institutions give an average salary of \$2,000 or less; the most frequent case is an average salary of from \$1,600 to \$1,700; almost half of the institutions give a salary less than \$1,800. Allowing as before for the fact that the larger institutions pay higher salaries, the average salary of the associate professor in the one hundred strongest institutions is about \$1,900.

In the grade of assistant professor, which is reported by ninety-eight of these one hundred and three institutions, the lowest average is \$850 (Ohio Wesleyan University) and the highest average is \$2,719 (Harvard University). There are three institutions reporting an average salary for this grade below \$1,000‡ and six reporting an average salary above \$2,000.§ Three-fourths of the institutions report an average salary between \$1,200 and \$1,800; the most frequent salary

* Georgia School of Technology	\$1,200
Syracuse University	1,291
Ohio Wesleyan University	1,300
University of Mississippi	1,325
University of Maine	1,500
† Harvard University	\$3,600
College of the City of New York . .	3,189
University of Chicago	2,800
Leland Stanford Junior University .	2,700
‡ Ohio Wesleyan University	\$ 850
Ohio University (Athens)	900
Syracuse University	978
§ Harvard University	\$2,719
University of Toronto	2,400
College of the City of New York . .	2,250
Haverford College	2,240
Columbia University	2,201
University of Chicago	2,200

is one between \$1,300 and \$1,500; half of the institutions pay less than \$1,500. Making allowances for the higher salaries paid by a few large universities, the average salary of an assistant professor in the one hundred strongest colleges and universities of the United States and of Canada is about \$1,600. There are a great many reasons why this salary might be regarded as a more representative one than the average of \$2,500 received by the full professor. It is attained at the age when a man, if not already married, should be enabled to marry and raise a family. Its inadequacy for a scholar who has devoted a number of years in training for this position is obvious.

The grade of instructor represents as a rule a teacher giving full time to the college, but doing so at the beginning of his career, with high probability of advancement if he proves his worth. The strongest colleges of America range in respect to their average salary for such a grade from \$350 to \$1,800. There is a continuous series from the low to the high rate; three-fourths of the institutions give between \$700 and \$1,200; a third give between \$900 and \$1,100; nearly half of them give \$950 or less; only one in six gives over \$1,200. It appears that a college teacher of the superior gifts and training demanded by these institutions receives during the first four years of his permanent professional career on the average a little over \$1,000.

The position of an assistant is that of an apprentice. It varies greatly in responsibility in different institutions and in the different departments of an institution. In some cases the assistant may have practical control of a large class. In others he is hardly more than a helper in a laboratory. The range of his salary is wide. It varies from an average salary in some institutions of only \$100 a year to an average salary at the Rensselaer Polytechnic Institute of \$1,200 a year. In seven cases the assistants receive \$900 or more.* The average salary is about \$500. This remuneration is not quite so paltry as it appears upon its face. The salary usually means payment for only a fraction of the assistant's time and energy, the balance being devoted to study in the institution for a graduate or professional degree. Generally the tuition charges for these courses are remitted to the assistant. Sometimes also, by acting as the proctor of a dormitory, he receives a room free of rent. The position of assistant being more truly a combination of a fellowship and an apprenticeship to the profession of teaching than a regular teaching position, these lower limits of college salaries should not be regarded as if they were remuneration for regular work.

* Rensselaer Polytechnic Institute.	\$1200
College of the City of New York.	1138
University of Wyoming.....	1000
Armour Institute of Technology..	900
Bryn Mawr College.....	900
Dartmouth College.....	900
Hamilton College.....	900

In considering these grades below the rank of full professor, attention should likewise be paid to the age at which the salary they pay is attained. From such replies as were received, it appears that the average age of entrance to a rank allotted an average salary of from \$1,000 to \$1,500 varies amongst institutions from 21 to 33 years, with most of the institutions reporting ages from 24 to 30 inclusive. The most typical case is an average age of 27.

The typical case or central tendency for the age of entrance to a grade allotted an average salary of from \$1,500 to \$2,000 is an average age of 30. The variations amongst the institutions reporting range from 25 to 37, with nearly nine-tenths lying between 27 and 35 inclusive.

When the average salary is from \$2,000 to \$2,500, the average age of attaining the grade varies in the returns from 27½ to 40, with six-tenths lying between 29 and 35 and with the typical case or central tendency at 33.

The returns for the age of entrance to average salaries of \$2,500 or over, that is, to the rank of full professor, is, as mentioned before, thirty-four years. Of course, the well paid professorships are attained later than those with smaller salaries attached. The data in regard to these ages are not numerous enough to warrant conclusive statements. It would appear as if professorships worth from \$2,500 to \$3,000 were given to men between 30 and 42½ years and that it is between 35 and 39 years that a man is elected to the professorship paying \$3,000 a year or more.

These figures, 27 years for entrance to a position worth \$1,000 to \$1,500, 30 years for entrance to a position worth from \$1,500 to \$2,000, 33 years for entrance to a position worth from \$2,000 to \$2,500, and 34 years for entrance to a position worth \$2,500 or over, are strictly the approximate averages of the average ages at entrance as reported by institutions. They do not directly give the average age of the *individual men* at entrance to a position worth \$1,000 to \$1,500 and so on, in these institutions. To answer with certainty the question, "At what age may such a man as these institutions are willing to appoint to a position worth \$1,000, or \$2,000, or \$3,000, expect to reach that position?" records of *each individual's* past salaries and ages at the time each was allotted would be necessary. However, the result from such an adequate study will probably not diverge far from the following answer: A man acceptable to these institutions for a position worth \$1,250 will be on the average 28 years old; a man appointed to a position worth \$1,750 will be on an average 31 years old when appointed to it; one appointed to a position worth \$2,250 will be on the average 33 years old; one appointed to a position worth \$2,500 or over will be on the average 34 years old.

A table is herewith given (Table VI) showing the average age at present of the full professor in the various faculties of thirteen typical American universities. This will enable a comparison to be made with Tables XXIII and XXIV in the discussion devoted to professors in German universities.

TABLE VI

AVERAGE AGE OF FULL PROFESSORS IN THIRTEEN AMERICAN UNIVERSITIES

UNIVERSITY	Number of Professors	AVERAGE AGE IN GIVEN FACULTY					Average of Faculties
		Liberal Arts	Science	Theology	Law	Medicine	
Brown University.....	27	46.5	52.7	....	....	....	49
Columbia University....	123	51.2	44.4	....	49.2	46.0	45.5
Cornell University.....	63	49.4	43.5	....	44.4	52.8	47.7
Harvard University....	91	49.3	50.9	51.7	55.0	55.8	51.6
Leland Stanford Junior University.....	27	44.9	46.6	....	....	....	45.8
Princeton University...	46	44.4	46.7	....	....	....	45.4
Tulane University of Louisiana.....	37	45.3	41.0	....	62.2	55.5	48.2
University of California.	67	52.9	50.4	....	54.0	47.0	49.9
University of Chicago....	65	46.5	47.4	51.3	39.8	49.0	46.6
University of Illinois...	30*	43.9	48.4	....	43.8	....	46.1
University of Virginia..	27	48.1	56.0	....	45.3	43.0	49.2
Vanderbilt University..	11†	49.2	44.6	....	....	....	46.7
Yale University.....	92	50.8	50.4	50.8	52.2	43.4	49.9

While, as stated in the early part of this Bulletin, the total annual income of an institution does not seem to be the best method of classification, nevertheless, as the income of an institution must play a large part in the determination of salaries, it is interesting to notice the relation between these two classes of statistics.

Table VII gives the figures in tabular form.

Central general tendencies can naturally be observed. Thus in institutions with annual incomes below \$10,000, the central tendency is toward an average professor's salary of \$700; in institutions receiving from \$10,000 to \$25,000, the tendency is toward an average salary of somewhat over \$1,000; in institutions receiving from \$25,000 to \$50,000, it is toward \$1,250; in institutions receiving from \$50,000 to \$100,000, it is toward \$1,700; in institutions receiving from \$100,000 to \$250,000, it is toward \$2,000; in institutions receiving from \$250,000 to \$600,000, it is toward \$2,500; in the ten with the largest incomes, it is toward \$3,400.

* This does not include professors in Medical School.

† This does not include professors in Law and Medical Schools.

TABLE VII

**THE AVERAGE SALARIES OF FULL PROFESSORS ARRANGED ACCORDING
TO THE INCOMES OF INSTITUTIONS**

SCALE FOR AMOUNT OF AVERAGE SALARY (in dollars)	Scale for Annual Incomes of Institutions (in dollars.) Under each head is given the number of institutions paying salaries as indicated by scale in first column.						
	750,000 or over	250,000 to 600,000	100,000 to 250,000	50,000 to 100,000	25,000 to 50,000	10,000 to 25,000	1,000 to 10,000
200 to 399	....	....	....	....	....	1	9
400 " 599	....	....	....	....	2	11	19
600 " 799	....	....	....	2	13	17	25
800 " 999	....	....	....	....	11	24	20
1,000 " 1,199	....	....	....	7	15	39	5
1,200 " 1,399	....	....	2	3	19	25	1
1,400 " 1,599	....	....	2	11	18	8	....
1,600 " 1,799	....	....	5	7	11	....	....
1,800 " 1,999	....	2	13	11	6	2	....
2,000 " 2,199	....	7	16	11	2	1	....
2,200 " 2,399	....	4	3	8	1	....	....
2,400 " 2,599	....	....	5	1	1	....	....
2,600 " 2,799	....	2	8	1	1	....	....
2,800 " 2,999	1	3	4	....	....	....	....
3,000 " 3,199	1	5	3	....	....	....	....
3,200 " 3,399	1	1	2	....	....	....	....
3,400 " 3,599	1	2	....	1	....	....	....
3,600 " 3,799	1	1	....	....	....	....	....
3,800 " 3,999	....	....	....	....	....	....	....
4,000 " 4,199	1	....	....	....	....	....	....
4,200 " 4,399	1	....	....	....	....	....	....
4,400 " 4,599	1	....	....	....	....	....	....
4,600 " 4,799	....	1	....	....	....	....	....
4,800 " 4,900	....	....	....	....	....	....	....
5,000	....	....	1	....	....	....	....

There is, however, great variability within each group, some large institutions failing to afford even mediocre salaries* and some small institutions offering exceptionally high salaries.†

* Instances are: Syracuse University, income \$279,000, professor's average salary \$1,806; Ohio State University (Columbus), income \$475,000, professor's average salary \$2,041.

† Instances are: Haverford College, income \$78,650, professor's average salary \$3,440; Dalhousie University, income \$40,250, professor's average salary \$2,300; General Theological Seminary, income \$128,643, professor's average salary \$5,000; Victoria University, income \$48,485, professor's average salary \$2,600. The last institution is affiliated with the University of Toronto and is perhaps an illustration of how an institution's income is released for better salaries when it partially gives up teaching the sciences with their expensive laboratories, etc.

TABLE VIII
THE AVERAGE SALARIES OF INSTRUCTORS ARRANGED ACCORDING TO THE
INCOMES OF INSTITUTIONS

SCALE FOR AMOUNT OF AVERAGE SALARY (in dollars)	Scale for Annual Incomes of Institutions (in dollars). Under each head is given the number of institutions paying salaries as indicated by scale in first column.						
	750,000 and over	250,000 to 600,000	100,000 to 250,000	50,000 to 100,000	25,000 to 50,000	10,000 to 25,000	1,000 to 10,000
0 to 99	....	....	....	....	....	1	1
100 " 199	....	....	....	1	2	....	3
200 " 299	....	....	....	....	1	6	5
300 " 399	....	....	1	1	6	10	8
400 " 499	....	....	1	1	8	10	7
500 " 599	....	1	1	4	12	11	6
600 " 699	....	....	2	8	16	17	....
700 " 799	....	3	8	10	15	7	1
800 " 899	....	4	8	7	3	4	....
900 " 999	1	5	9	6	4	1	....
1,000 " 1,099	3	8	14	9	7	1	....
1,100 " 1,199	2	3	4	4	1	....	....
1,200 " 1,299	1	3	4	5	....	....	....
1,300 " 1,399	....	1	4	....	....	....	....
1,400 " 1,499	2	2	....	1	....	....	....
1,500 " 1,599	1	....	1	....	2	....	....
1,600 " 1,699	....	1	....	....	....	....	....
1,700 " 1,799	....	....	....	1	....	....	....
1,800 " 1,899	1	....	....	....	....	....	....
1,900	....	....	....	....	....	....	....

The average salary of an instructor varies with the amount of an institution's income in the same way as was noted in the case of the professor's salary. Its central tendency rises:

From \$375 for institutions with incomes below \$10,000;
 To \$550 for institutions with incomes of from \$10,000 to \$25,000;
 To \$650 for institutions with incomes of from \$25,000 to \$50,000;
 To \$850 for institutions with incomes of from \$50,000 to \$100,000;
 To \$950 for institutions with incomes of from \$100,000 to \$600,000;
 To \$1,100 for institutions with incomes of \$750,000 and over.

Within each income group there is great variability, some large institutions again reporting salaries almost impossible to live on* and some small institutions making excellent provision for their young teachers.†

* Illustrations are: Harvard University, income \$1,827,789, average salary of instructor \$1,048; Cornell University, income \$1,082,513, average salary of instructor \$924; University of Virginia, income \$202,000, average salary of instructor \$475.

† Instances are: Washington and Jefferson College, income \$46,880, average salary of

Data concerning salary schedules should finally be considered in connection with the cost of living in different localities. Information concerning the cost of living is obtainable, though with much difficulty, but the returns are not adequate to a proper statistical treatment. The matter must therefore be left to a common-sense judgment, with the single reminder that the cost of such a life as a scholar or man of science *ought to lead* will probably not vary much with localities in this country. If he is in a small town far away from any centre of art, science, and expert skill, he needs a liberal allowance for travel, books, pictures, and the like, for the occasional summoning of expert medical or other service, and for the distant education of his children.

The most important thing in regard to the income of college teachers in relation to the cost of living in the community in which the college is situated, is whether the salary paid by the college is above or below the indispensable line of comfort. In every community there is a certain sum which represents what a man with a family needs to pay his landlord, his butcher, his grocer, and his tailor. This sum must be fixed having in mind the quarter of the town in which the college professor should live, how his table should be provided, and what his wife and children should wear. These requirements need not be luxuriously provided for, but they should be provided for as a well educated and refined man needs they should be. If the institution in which he teaches pays the professor a few hundred dollars above this minimum line of comfort, he is free from worry, his family life is cheerful, he can give the best that is in him to his institution and its students. An income only a few hundred dollars below this level puts the professor in a situation involving worry and anxiety. Heretofore little has been done to fix salaries in respect to any fair or even possible line of comfort. And it has therefore happened that at the same time when small economies in salaries have lowered an entire faculty into discontent and inefficiency, an amount sufficient to raise the teaching body into an atmosphere of content and cheerful work has been spent on facing the campus buildings with marble, and in giving to the athletic field the appearance of a Roman amphitheatre.

It may be objected that most of these superfluous educational accessories came to an institution by way of gift. That such is the fact is comparatively unimportant. If academic authorities approached their constituencies emphasizing that a college is really only its teachers, those teachers would not long be regarded as of less importance than buildings and athletic fields. But the providing of adequate salaries is generally the last item on the administration program and the items ahead of it in the list win at the teachers' expense. A

instructor \$1,750; Rutgers College, income \$87,000, average salary of instructor \$1,425. It ought perhaps to be mentioned that at Washington and Jefferson College there is no intermediate grade between the instructor and the full professor.

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California Teachers Association

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Audrey Ohlson-Smith

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Thanks so much!

Good luck in Mill

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well-known teacher recently wrote, in sadness rather than bitterness, "The buildings of our university have been paid for by our professors."

A first scrutiny of Table II will cause each reader to notice certain educational policies. One of the most striking of these policies is that adopted by Haverford College. The income of Haverford College is exceeded by the income of about one hundred and fifteen colleges and universities in the United States and Canada, but only eight of these one hundred and fifteen institutions pay higher salaries to their professors. The least rich of these eight has an income six times larger than Haverford. That the policy of the college is to concentrate its energies upon salaries rather than equipment and other expenses can be seen also from the following note, appended by the college authorities to the answer returned to the enquiries of the Foundation: "The expense of teaching is great—(1) because this is an expensive suburb of Philadelphia and rents and wages are high, (2) because we have very few men in lower grades, but *professors* teach lower as well as upper classes, (3) because we want men of human interests and character as well as scholarship, and the choice is limited, (4) because we mean to keep some men who command high salaries in the best universities." In the light of this announcement by the college authorities it is not surprising that the faculty at Haverford is of very high merit.

It should be noted that this high average of the Haverford professors does not mean good salaries paid to some men at the expense of the incomes of other men. The minimum salary paid to a professor is \$1,700. The Haverford associate professor and instructor hold the same relative financial position among associate professors and instructors as the Haverford full professor among full professors. It is evident, also, that these high salaries do not mean the combination of what would be two salaries elsewhere and therefore an unusual burden of work placed upon the Haverford teacher, for the proportion of professors to students is one to eleven and the proportion of the entire instructing force to students is one to seven. The entrance requirements of Haverford are equal to those required by the largest universities and it is one of the thirteen colleges and universities in the United States requiring 14 units or over for admission, that admits students to the freshman class only by examination. Haverford College is, therefore, apparently entitled to the conspicuous credit of having placed before everything else the consideration of its teachers.

It will be evident, on the other hand, to any one who examines the table with care, that in some of the institutions mentioned in this table the excessive low salaries are closely connected with the effort to spread instruction over an enormous range of subjects.

At the top of Table II there is an interesting comparison which must necessarily attract the notice of a reader. Columbia University and Harvard University have almost the same number of persons in their teaching forces, 559 and 573 respectively, and about an equal proportion of each force are

professors. The average salaries at Harvard for the full professors and for the assistant professors are higher than are the average salaries at Columbia for the full professors and for the adjunct professors; yet the total annual amount expended by Columbia in salaries to the instructing staff is \$300,000 larger than is the similar expenditure by Harvard University. After making allowance for the salary budget appropriated by Radcliffe College (Barnard College being included in the figures for Columbia University) this excess of the Columbia budget is equal to the total annual income received by an institution of the size of Dartmouth College. At least half of this difference between the salary expenditures at Columbia and at Harvard is due to the difference in the salaries paid in the teaching grades below faculty rank. The average instructor at Harvard receives \$753 a year less than the average instructor at Columbia, and in the grade of assistant the difference between the two college departments is about \$150. There is also a considerable difference between the average salary of the junior officer at the College of Physicians and Surgeons of Columbia, and the similar average for the Medical School of Harvard. These amounts of \$750 and \$150 do not seem much in themselves, but when they are multiplied by the large number of teachers who in a great university such as Harvard hold the titles of instructor and assistant, the result is a saving of about \$130,000 a year, enough to pay all the salaries of all the professors and of all the other teachers at either Brown University, or at Wellesley, or at Vassar.

The figures hitherto given have been for the hundred institutions in the United States and Canada paying the largest amount of aggregate salaries. This has seemed to be the most representative criterion. And yet it may appear to be putting too much stress upon the mere size of an educational institution, for the salary budget is generally roughly proportioned to the size. In Table IX are therefore given the figures concerning fifty-four well-known institutions each of which is carrying on its work at an expenditure for salaries of less than \$45,000 a year.

The institutions in this table report an average salary for professors ranging from \$1,175 (Franklin College, Indiana) to \$2,783 (Polytechnic Institute of Brooklyn). The average salary of \$900 and the three averages reported as \$1,000 are all in institutions which give, in addition to this monetary return, the accommodation of room and board. These salaries can, in consequence, be conservatively estimated at \$1,350 and \$1,400 respectively. Therefore, only four of the fifty-four institutions pay an average salary of less than \$1,300 (Cornell College, Monmouth College, Coe College, and Franklin College).

Four institutions report an average salary above \$2,000: Polytechnic Institute of Brooklyn, \$2,783; Dalhousie University, \$2,300; Rose Polytechnic Institute, \$2,250; Colorado School of Mines, \$2,233. Six other institutions pay an average of \$2,000 a year: Adelphi College, Bowdoin College, Lafayette College, Trinity College (Hartford), De Pauw University, and the University

of South Carolina. Half of the institutions in this table pay to their professors an average salary of \$1,600 or less, the average of the averages being \$1,652. The most frequent average salary, however, is that of \$1,800.

Considering in detail these average salaries for professors, it will be noticed that all those below \$1,500 a year are paid either at colleges located in communities where living is comparatively inexpensive or they are salaries paid under unusual circumstances in addition to the providing of rooms and board. The latter institutions are Mount Saint Mary's College, Pennsylvania College for Women, Wilson Female College, and Elmira College. The colleges whose salaries are apparently adjusted to a comparatively inexpensive scale of personal expenditure are Franklin College, \$1,175; Coe College, \$1,200; Cornell College (Mount Vernon, Iowa), \$1,220; Monmouth College, \$1,270; Olivet College, \$1,300; Ripon College, \$1,336; Clarkson School, \$1,300; Lawrence University, \$1,400; Drury College, \$1,400; Carleton College, \$1,400; Marietta College, \$1,433; Bates College, \$1,433.

Of the institutions paying the highest average salaries, the Brooklyn Polytechnic Institute, \$2,783, and Adelphi College (Brooklyn), \$2,000, are in a large city where the cost of living is high. This is also true, although probably not to so large a degree, at Trinity, Rose, and Lafayette. The position of Dalhousie is noteworthy. Living in Nova Scotia, according to information supplied by the university authorities, is inexpensive as compared with most parts of the United States, yet the average salary of a professor at Dalhousie, \$2,300, is on a par with the salaries at McGill University and the University of Nebraska, institutions possessing incomes ten times larger than the total annual revenue of Dalhousie.

It will be noticed that, with the exception of a few state universities in southern and western states, only four of these institutions in the United States (DePauw University, Lawrence University, the University of Wooster, and the University of the South) have called themselves "universities." The others have confined themselves to the work which is indicated by their name of college* and this is probably one reason of their strength. Three of these institutions have borne the name university for over half a century. DePauw University received the name in its charter of 1837, when it was incorporated as The Indiana Asbury University. Lawrence University assumed the title when, in 1852, it changed its name from "The Lawrence Institute of Wisconsin."

* Centre College is the collegiate department of the Central University of Kentucky, but the figures are only for the college, not the entire university.

TABLE

DATA CONCERNING PARTIAL LIST OF INSTITUTIONS IN WHICH ANNUAL

Institution	Total Annual Income	Annual Appropriation for Salaries of Instructing Staff	Average Salary of Professor	Average Age of Entrance to Grade of Professor	Average Salary of Associate Professor	Average Age of Entrance to Grade of Associate Professor
IOWA COLLEGE Grinnell, Iowa.....	\$60,000	\$44,250	\$1,500	33	\$1,000	27
POLYTECHNIC INSTITUTE OF BROOKLYN Brooklyn, New York.....	59,000	43,150	2,783			
UNIVERSITY OF THE SOUTH Sewanee, Tennessee.....	60,845	42,836	1,500	35		
DEPAUW UNIVERSITY Greencastle, Indiana.....	67,000	42,750	2,000			
POMONA COLLEGE Claremont, California.....	50,000	42,000	1,500			
LAFAYETTE COLLEGE Easton, Pennsylvania.....	77,142	40,374	2,000			
BOWDOIN COLLEGE Brunswick, Maine.....	72,063	39,550	2,000	30		
UNIVERSITY OF WYOMING Laramie, Wyoming.....	84,299	39,080	1,900	34	1,700	
COLORADO COLLEGE Colorado Springs, Colorado.....	60,000	38,000	1,775			
DICKINSON COLLEGE Carlisle, Pennsylvania.....	61,748	37,576	1,700	33		
ADELPHI COLLEGE Brooklyn, New York.....	54,000	37,575	2,000			
UNIVERSITY OF ARIZONA Tucson, Arizona.....	90,000	37,300	1,900			
UNIVERSITY OF SOUTH CAROLINA Columbia, South Carolina.....	72,857	36,730	2,000		1,500	
CORNELL COLLEGE Mount Vernon, Iowa.....	55,436	36,702	1,220	32		
WOMAN'S COLLEGE OF BALTIMORE Baltimore, Maryland.....	67,151	36,450	1,818	32.5		
TRINITY COLLEGE Hartford, Connecticut.....	43,045	36,250	2,000			
BELOIT COLLEGE Beloit, Wisconsin.....	75,000	35,000	1,600	32		
WASHINGTON AND JEFFERSON COLLEGE Washington, Pennsylvania.....	46,880	34,500	1,823			
ALLEGHENY COLLEGE Meadville, Pennsylvania.....	47,000	34,200	1,800	24		
LAWRENCE UNIVERSITY Appleton, Wisconsin.....	43,000	34,000	1,400	31		
DALHOUSIE UNIVERSITY Halifax, Nova Scotia.....	40,240	33,500	2,300			
TRINITY COLLEGE Durham, North Carolina.....	63,000	33,060	1,850			
LAKE FOREST COLLEGE Lake Forest, Illinois.....	41,165	32,932	1,800	33		

† Interest at 5% on \$500,000 additional endowment will be available in 1909.

DITURE FOR INSTRUCTING SALARIES RANGES FROM \$10,000 TO \$45,000

Average Age of Entrance to Grade of Assistant Professor	Average Salary of Instructor	Average Age of Entrance to Grade of Instructor	Average Salary of Assistant	Average Age of Entrance to Grade of Assistant	Total Number of Students in Institution	Total Instructing Staff in Institution	Ratio	Total Number of Students in College	Total Instructing Staff in College	Ratio
27	\$ 800	23	\$ 153	21.5	*553	35	15.8	450	31	14.5
.....	392	.....	.....	.....	.....	.....	.....	250	40	6.2
27	700	24	500	23	*317	34	9.3	119	11	10.8
.....	743	.....	.....	.....	*753	35	21.5	548	25	21.9
.....	800	.....	.....	.....	*317	31	10.2	267	23	11.6
.....	750	.....	475	.....	.....	.....	.....	442	36	12.3
27	1,000	25	.....	.....	394	53	7.4	305	20	15.2
.....	1,100	.....	1,000	.....	*222	30	7.4	110	21	5.2
.....	602	.....	.....	.....	*607	44	13.7	407	31	13.1
25	525	.....	.....	.....	392	26	15	314	18	17.4
.....	625	.....	.....	.....	*463	27	17.1	295	24	12.3
.....	1,120	.....	.....	.....	.....	.....	.....	*63	17	9
.....	800	.....	.....	.....	*285	29	9.8	191	18	10.6
28	760	25	.....	.....	*455	39	11.6	395	27	14.6
31.5	958	31.5	533	24.5	.....	.....	.....	340	28	12.1
.....	1,000	.....	500	.....	.....	.....	.....	208	22	9.4
28	1,000	26	.....	.....	.....	.....	.....	303	30	10.1
.....	1,750	.....	300	.....	.....	.....	.....	264	16	16.5
30	1,000	25	300	22.5	.....	.....	.....	266	19	14
28	700	26	300	.....	*493	33	14.9	327	26	12.6
.....	600	.....	.....	.....	358	48	7.4	266	21	12.6
.....	650	.....	166	.....	*280	26	10.7	264	23	11.4
30	1,000	25	.....	.....	.....	.....	.....	*217	19	11.4

atalogue for 1906-07.

* Exclusively in college.

† Entitled "Associate Professors."

TABLE

DATA CONCERNING PARTIAL LIST OF INSTITUTIONS IN WHICH ANNUAL

Institution	Total Annual Income	Annual Appropriation for Salaries of Instructing Staff	Average Salary of Professor	Average Age of Entrance to Grade of Professor	Average Salary of Associate Professor	Average Age of Entrance to Grade of Associate Professor
RANDOLPH-MACON WOMAN'S COLLEGE Lynchburg, Virginia.....	\$130,713	\$32,707	\$1,639	37.5		
HAMILTON COLLEGE Clinton, New York.....	50,000	32,500	1,800			
ROSE POLYTECHNIC INSTITUTE Terre Haute, Indiana.....	43,756	31,600	2,250	37.5	\$1,800	32.5
COLORADO SCHOOL OF MINES Golden, Colorado.....	110,000	30,500	2,233			
UNIVERSITY OF WOOSTER Wooster, Ohio.....	43,057	31,380	1,500	37.5		
UNIVERSITY OF MONTANA Missoula, Montana.....	71,500	30,100	1,800			
OLIVET COLLEGE Olivet, Michigan.....	46,600	29,200	1,300	35		
ALBION COLLEGE Albion, Michigan.....	37,078	28,775	1,550	30		
KENYON COLLEGE Gambier, Ohio.....	47,000	28,500	1,600	32.5		
COLLEGE OF WILLIAM AND MARY Williamsburg, Virginia.....	43,000	28,495	1,800			
MOUNT SAINT MARY'S COLLEGE Emmitsburg, Maryland.....	50,000	28,000	1,000			
BATES COLLEGE Lewiston, Maine.....	39,167	26,500	1,433	32		
WILSON COLLEGE Chambersburg, Pennsylvania.....	110,000	26,500	1,000	32		
EARLHAM COLLEGE Richmond, Indiana.....	58,000	24,000	1,550	30		
WABASH COLLEGE Crawfordsville, Indiana.....	41,608	23,550	1,600			
CARLETON COLLEGE Northfield, Minnesota.....	34,900	23,150	1,400	32		
COLBY COLLEGE Waterville, Maine.....	56,939	23,033	1,800	32.5		
MARIETTA COLLEGE Marietta, Ohio.....	24,244	22,670	1,433			
CENTRE COLLEGE Danville, Kentucky.....	32,369	21,827	1,600	30		
HOBART COLLEGE Geneva, New York.....	37,200	21,657	1,700	35	1,400	30
WELLS COLLEGE Aurora, New York.....	90,041	21,150	1,600	36.5	1,275	30
DRURY COLLEGE Springfield, Missouri.....	29,000	21,000	1,400			

• Including payments of students for board.

• Including Bexley Hall, the theological seminary.

• Also board, apartments, and laundry.

IX—Continued

EXPENDITURE FOR INSTRUCTING SALARIES RANGES FROM \$10,000 TO \$45,000

Average Salary of Assistant Professor	Average Age of Entrance to Grade of Assistant Professor	Average Salary of Instructor	Average Age of Entrance to Grade of Instructor	Average Salary of Assistant	Average Age of Entrance to Grade of Assistant	Total Number of Students in Institution	Total Instructing Staff in Institution	Ratio	Total Number of Students in College	Total Instructing Staff in College	Ratio
\$1,307	30	\$ 749	27.5	\$ 558	22.5	*358					
1,300		1,100		900					178	19	8
1,200	27.5	1,000	24	500					229	23	8
1,550		1,175							*294	17	17
†1,100	37.5	600	26.5	300	24	547	34	16	362	28	12
		1,100		600		*247	20	12.3	189	19	8
1,000	30	800	27.5			*255	29	8.7	211	20	10
900	25	615	23.5			*383	25	16.1	239	17	14
		900							118	15	7
†1,000		600									
*400		*150									
		1,167	26	183	23				438	23	19
*900	28	*700	28	*250	22	*344	34	10.1	240	22	10
		600	25	77	20	*380	31	12.2	325	27	12
930									*291	17	17
†1,300		750	24			*315	20	15.7	281	17	16
†1,350	27.5	900	26.5	400	24				*237	15	15
†1,120		750		115		275	21	13	129	16	8
		1,000	22	250	21				*154	20	7
1,100	28	700	24	300	21				104	16	6
900	30	750							169	24	7
687		453				*461	21	21.9	269	14	19

* Catalogue for 1906-07.

† Entitled "Associate Professors."

* Entitled "Adjunct Professors."

* Catalogue does not separate the students in the department of music, of art, and of physical culture from the students in the college.

TABLE

DATA CONCERNING PARTIAL LIST OF INSTITUTIONS IN WHICH ANNUAL

Institution	Total Annual Income	Annual Appropriation for Salaries of Instructing Staff	Average Salary of Professor	Average Age of Entrance to Grade of Professor	Average Salary of Associate Professor	Average Age of Entrance to Grade of Associate Professor
COE COLLEGE Cedar Rapids, Iowa.....	\$28,137	\$20,989	\$1,200	30	.....	.....
RIPON COLLEGE Ripon, Wisconsin.....	47,100	20,900	1,336	.....	.....	.....
MIDDLEBURY COLLEGE Middlebury, Vermont.....	28,491	20,160	1,870	32	.....	.....
PENNSYLVANIA COLLEGE FOR WOMEN Pittsburgh, Pennsylvania.....	41,000	20,000	900	28	.....	.....
ELMIRA COLLEGE Elmira, New York.....	38,139	18,672	1,000	30	.....	.....
MONMOUTH COLLEGE Monmouth, Illinois.....	36,967	18,500	1,270	35	.....	.....
FRANKLIN COLLEGE Franklin, Indiana.....	37,552	15,000	1,350	28	.....	.....
CLARKSON MEMORIAL SCHOOL OF TECHNOLOGY Potsdam, New York.....	24,540	11,950	1,350	.....	.....	.....
KNOX COLLEGE Galesburg, Illinois.....	28,012	11,509	1,400	32	.....	.....

*Also board, apartments, and laundry.

-Continued

EXPENDITURE FOR INSTRUCTING SALARIES RANGES FROM \$10,000 TO \$45,000

Age of Assistant Professor	Average Age of Entrance to Grade of Assistant Professor	Average Salary of Instructor	Average Age of Entrance to Grade of Instructor	Average Salary of Assistant	Average Age of Entrance to Grade of Assistant	Total Number of Students in Institution	Total Instructing Staff in Institution	Ratio	Total Number of Students in College	Total Instructing Staff in College	Ratio
00	25	\$ 500	22	\$135	20	.....	.....	.....	*206	28	7.3
00	.....	708	.....	.....	.....	*201	24	8.3	157	20	7.8
...	.....	1,100	31	.....	.....	.....	.....	.....	*178	11	16.1
...	.....	1600	24	.....	.....	.....	.....	.....	45	10	4.5
...	.....	.....	.....	.....	.....	278	17	16.3	197	12	16.4
75	.....	675	25	.....	.....	*425	25	17	233	18	12.9
...	.....	.....	.....	.....	.....	*214	15	14.2	160	13	12.3
...	.....	.....	.....	.....	.....	.....	.....	.....	*80	11	7.2
00	29	800	25	.....	.....	*521	27	19.2	224	19	11.7

catalogue for 1906-07.

† Entitled "Associate Professors"

DePauw University consists of the Asbury College of Liberal Arts, a School of Music (degree of Bachelor of Music conferred), and a School of Art (degree of Bachelor of Painting conferred). There are six graduate students. Lawrence University consists of a College of Liberal Arts, a Department of Art and Painting (no degree conferred), a School of Music (degree of Bachelor of Music conferred), a School of Commerce (degree of Bachelor of Commercial Science conferred), and a School of Expression (degree of Bachelor of Arts in Oratory conferred). The University of Wooster consists of a College, a Conservatory of Music, a School of Art, and a Bible and Missionary Training School. These schools of music and commerce differ but little from the usual musical and business departments attached to most of the smaller educational institutions throughout the middle west. It is unfortunate that the name university assumed at a period when the meaning of the words "college" and "university" were not sharply defined in America, should hamper the correct appreciation of institutions which can serve education efficiently only by confining their work to that of a good college.

Lake Forest was chartered as a university in the same period, 1857, when an institution was named according to what it hoped for in the remote future, not according to what it had a reasonable expectation of accomplishing. The trustees have not deemed it expedient to obtain a new charter, but with admirable judgment the institution is designated in its publications as Lake Forest College.

The other institutions in the table confine themselves somewhat strictly to the usual collegiate departments, and call themselves colleges. Dickinson College has for a long time had a law school, Trinity College, Durham, has recently established a law school, Bowdoin College has a medical school, and Kenyon College has been connected since its foundation with a theological seminary of the Episcopal Church.

It will be seen that with the exception of the state universities the only institutions in this table that are giving, within the limits of an expenditure for salaries of less than \$45,000 a year, university work in the professional meaning of the term, are Dalhousie University and the University of the South. The other institutions are really colleges. And among the state institutions the University of South Carolina has only a school of law and normal courses in addition to its regular college departments, and the other state and territorial universities are those of the far west, where full professional schools have not been established.* As the fifty-four institutions on this list were selected with care, the small proportion of universities is not without significance. It is clear that it is practically impossible for a university to exist in most parts of the United

*The University of Wyoming has a college of engineering and a school of mines. Most of these state universities have also the usual music, art, and business departments.

States and do good work at an expenditure for teachers' salaries of less than \$45,000 a year. It is equally clear that an excellent college can be supported at that annual expenditure for salaries.

The distinctive grade of associate professor exists at only seven of the institutions in this table. The grade of assistant professor is found at all but eleven. At seven institutions the assistant professor receives an average salary of \$900 or less; Cornell College, \$900; Albion College, \$900; Wells College, \$900; DePauw University, \$850; Trinity College (Durham), \$750; Coe College, \$700; Drury College, \$687. Even making allowances for the low cost of living in the communities where these institutions are located, it is evident that an office to which such a salary is attached cannot be the assistant professorship as that grade is regarded at most of the strong universities and colleges.

The University of Wyoming, the Colorado School of Mines, and Dalhousie University are the only institutions which pay the assistant professor as much as \$1,500 a year, and the excellent teaching given in the latter institution is no doubt intimately related to the relatively high salaries paid to teachers. The average salary of the assistant professor of the institutions in this table is about \$1,200.

The average salary of the instructor reported by these institutions ranges from \$392 to \$1,750. The Polytechnic Institute of Brooklyn pays to this grade \$392, the College of William and Mary, \$350; Drury College \$453; Coe College, \$500; Dickinson College, \$525; and Earlham College and Dalhousie University each \$600. On the other hand, Washington and Jefferson College pays \$1,750, Hamilton College, Bates College, Middlebury College, the Colorado School of Mines, and the Universities of Arizona, Montana, and Wyoming each \$1,100. The instructor therefore must mean a very different grade at different institutions. The most usual average for an instructor is \$1,100. The average for all the averages in this table, however, is only a little above \$800.

At most of the institutions in this table the assistant is, from his salary, simply a helper in a laboratory or a theme-reader, giving but a few hours' work to the institution, for the average salary of this grade is only \$300. This is what the assistant receives at Harvard. At Lafayette College, Trinity College (Hartford), Randolph-Macon Woman's College, the Woman's College of Baltimore, Rose Polytechnic Institute, and the University of the South, the assistant receives \$500, the salary paid to that grade at Columbia University. At the University of Montana the assistant gets \$600, at Hamilton College, \$900, and at the University of Wyoming \$1,000.

The ages at which men receive the salaries given by the institutions in Table IX do not differ materially from the ages previously discussed in this paper as applicable to the one hundred large institutions. The age at which a man attains a full professorship is, on an average, thirty-three years. It was thirty-four years in the larger institutions.

PROPORTION OF TEACHERS TO STUDENTS IN RELATION TO EDUCATIONAL EFFICIENCY

In Tables II and IX are given in addition to the data concerning salaries certain statistics in regard to the student attendance and the size of the instructing staff. The number of students and teachers is given for each institution as a whole and also for the undergraduate colleges and the non-professional graduate schools.

These figures must be used with great caution. It would be a mistake to attach to them any extraordinary significance. For instance, the instructing staff includes every person who teaches in the institution except special lecturers and undergraduate assistants. In one institution a small instructing staff may be composed largely of members of the faculty giving their entire time and attention to teaching; in another institution a large instructing staff may consist in considerable part of young assistants just out of college and of all kinds of irregular and part-time teachers. The ratios in such cases can not be profitably compared. Similarly, although the student registration does not include summer students or preparatory students or students in six weeks' courses in agriculture, etc., it does group together those who make very different demands upon the teaching facilities of an institution. A girl who takes one lesson a week in "oratory," and a town boy who goes out to the college gymnasium one evening a week to exercise under the direction of the instructor in athletics, is often recorded in the catalogue along with the regularly matriculated college student who attends sixteen hours of lectures a week. By repeating the figures for the undergraduate colleges and the non-professional graduate schools, many of these occasional students have been eliminated, as have also the great array of teachers in medical and dental schools and other professional schools who give but a brief attendance at the institution.

The second set of totals and ratios is therefore more valuable than the first, and it is this second set of ratios which has been used in Table X. But comparisons even here are more likely to be fallacious than valuable. Besides the different composition of the teaching force in different institutions it has often been difficult to decide, from a professor's title in a catalogue, in what department of the institution he teaches, and whether he ought to be counted in the second set of totals or only in the first. The merit of the data lies in the fact that the same rules have been applied to all the institutions treated, and although in any particular case the ratio between teachers and students may not repre-

sent the actual facts, it is evident that, considering the one hundred and three institutions in Table II as a whole, very varying ratios between the numbers in the instructing staff and in the student body do actually exist. This variation amongst institutions is a very important fact. Why should one institution of those given in Table II need three times as many teachers per hundred students as another institution, or inversely, how can one of them get along with a third as large a staff per hundred students as another has? Should one college provide five times as many (or as few) teachers to a hundred students as another? This great variability may mean (1) great differences in the educational problems met by different institutions, all doing their work with the same adequacy, or it may mean (2) that the resources of some are inadequate, or it may mean (3) that the resources of some are not perfectly employed, or it may mean a combination of two or three of these conditions. A painstaking investigation of the exact condition of the staff, students, and curriculum in each institution is evidently very much needed.

TABLE X

PROPORTION OF TEACHERS TO STUDENTS IN UNDERGRADUATE COLLEGES AND NON-PROFESSIONAL GRADUATE SCHOOLS OF INSTITUTIONS IN TABLE II

RATIO OF 1 TO 4

Clark University, Worcester, 4.2

Johns Hopkins University, 4.3

RATIO OF 1 TO 5

McGill University, 5.7

RATIO OF 1 TO 6

Temple College, 6.4

Haverford College, 6.5

Massachusetts Institute of Technology, 6.7

West Virginia University, 6.9

RATIO OF 1 TO 7

State University of Oklahoma, 7.1

James Millikin University, 7.2

Washington University, 7.3

Rutgers College, 7.5

State University of North Dakota, 7.6

University of Virginia, 7.6

Bryn Mawr College, 7.7

Vanderbilt University, 7.7

George Washington University, 7.8

RATIO OF 1 TO 8

Williams College, 8.1

Mount Holyoke College, 8.1

Union College, Schenectady, 8.1

Western University of Pennsylvania, 8.1

University of Idaho, 8.2

Princeton University, 8.2

Michigan State Agricultural College, 8.7

Harvard University, 8.8

RATIO OF 1 TO 9

Montana State College of Agriculture and Mechanic Arts, 9	
Swarthmore College, 9.2	Simmons College, 9.2
University of Vermont, 9.3	Tulane University of Louisiana, 9.5
University of South Dakota, 9.6	Pennsylvania State College, 9.6
Agricultural College of Utah, 9.6	

RATIO OF 1 TO 10

Columbia University, 10	Armour Institute of Technology, 10
Tufts College, 10	University of Utah, 10
University of North Carolina, 10	University of Oregon, 10
Wesleyan University, 10	Iowa State College of Agriculture and Mechanic Arts, 10.1
Worcester Polytechnic Institute, 10.1	Howard University, 10.1
Virginia Polytechnic Institute, 10.1	Stevens Institute of Technology, 10.2
Wellesley College, 10.2	Cornell University, 10.3
University of Maine, 10.2	Western Reserve University, 10.6
University of Tennessee, 10.3	Alabama Polytechnic Institute, 10.8
Leland Stanford Junior University, 10.7	
State University of Kentucky, 10.8	

RATIO OF 1 TO 11

University of Wisconsin, 11	Case School of Applied Science, 11
Yale University, 11.1	University of California, 11.2
Brown University, 11.4	University of Mississippi, 11.4
Lehigh University, 11.9	Colgate University, 11.9

RATIO OF 1 TO 12

University of Illinois, 12	Washington and Lee University, 12
Vassar College, 12.2	University of Cincinnati, 12.2
University of Colorado, 12.7	

RATIO OF 1 TO 13

University of Kansas, 13.2	Georgia School of Technology, 13.3
University of Missouri, 13.4	Purdue University, 13.4
Ohio Wesleyan University, 13.4	Amherst College, 13.5
State University of Iowa, 13.9	

RATIO OF 1 TO 14

University of Washington, 14.1	University of Texas, 14.5
University of Michigan, 14.6	Kansas State Agricultural College, 14.9

RATIO OF 1 TO 15

Smith College, 15.2	Boston University, 15.2
University of Pennsylvania, 15.7	Ohio State University (Columbus), 15.8

RATIO OF 1 TO 16

Clemson Agricultural College, 16	University of Rochester, 16.1
Dartmouth College, 16.5	Northwestern University, 16.7
State College of Washington, 16.9	

RATIO OF 1 TO 17

New York University, 17.9

RATIO OF 1 TO 18

Oberlin College, 18.2

University of Chicago, 18.4

University of Minnesota, 18.6

RATIO OF 1 TO 19

Queen's University, 19

Ohio University (Athens), 19.7

RATIO OF 1 TO 20

University of Nebraska, 20

Syracuse University, 20.3

RATIO OF 1 TO 24

North Dakota Agricultural College, 24.8

RATIO OF 1 TO 25

Drake University, 25.7

No one informed concerning higher education in America will doubt that the differences in the problems met is one chief factor. Johns Hopkins University provides more teachers for a hundred students than the University of Chicago, partly because it has a larger proportion of graduate work. The college of Clark University is reported with one teacher to every four students, partly because it is a recent establishment. Proof of the fact that different institutions need different provisions because of the different work they do and ought to do is superfluous.

Nor will any one informed concerning higher education deny that the teaching resources of some institutions are inadequate. The significance of our data lies in the fact that unless there is some waste in some institutions, there is an enormous inadequacy in others. After making every allowance for differences in the proportion of part-time professors and assistants, for differences in the character of the work, and the like, it seems strange that we should find among institutions doing work of approximately equal difficulty, some with a provision of *over twice as many teachers as others*.

This fact is, perhaps, the most important one that appears in comparing institutions for higher education. It leads at once to this question, 'Given a college of liberal arts and sciences, or a medical school, or a law school of a certain size, what is the number of teachers that the administrative authority has a right to demand of the financial authorities for the proper conduct of the work,' and to the further question, 'Given a certain sum for salaries for such a college or school of a certain size, how much must be sacrificed in the quality of the teachers in order to get enough teachers?'

If the country as a whole could afford a teacher for every three university

students, it might be wise economy; but if the country as a whole can afford only one for eleven, it may be a waste for one institution to have many more than its share. There is presumably an optimum proportion of instructors to students, movement toward which brings increasing educational returns for each teacher added, and movement beyond which brings diminishing returns.

Some university teachers will deny this doctrine of diminishing returns, and very many of them will deny that any institution in this country has passed beyond this optimum proportion. The matter needs investigation, but the experience of elementary and secondary education and the general facts of human nature support the belief that, after the groups in which students are divided for instruction reach a certain minimum, further division produces very little educational gain. Indeed, there is some support for the belief that a class of fifteen students in the majority of undergraduate or professional subjects is *absolutely* better than a class smaller in number and that a seminar or pro-seminar or other specialized course is more efficient with eight students than with less. In any event it is as much the duty of the educational administration to use funds economically as it is the duty of society to provide more money for higher education. With all due regard to the necessity of presenting a wide range of subjects for study and of giving students close personal attention, it seems proper that an increase of the staff of a university beyond twelve men for a hundred students, or of the staff of a college beyond nine men for a hundred students, should be regarded not, as it now is, as an unmixed good, but as a step that may demand justification as truly as would an equal decrease.

The second question suggested by the great variation in the number of students per instructor was, 'Given a certain sum for salaries for a university or college of a given size, how much must be sacrificed in the quality of the teachers in order to have enough teachers?' As a concrete sample of this problem let us suppose an undergraduate college like that for men at Princeton, or for women at Mt. Holyoke, to have enrolled 200 freshmen, 160 sophomores, 150 juniors, and 140 seniors, a total of 650, and to have an allowance for salaries of \$70,000. Shall it employ 80 teachers at an average salary of less than \$900, or 60 teachers at an average salary of nearly \$1,200, or 40 teachers at an average salary of nearly \$1,800? In the first case it can provide twice as many courses or give each member of the staff only half as many hours of teaching as in the last case. Keeping the latter alike in both cases it could offer say 300 courses in the first case, and only 150 in the second.

Suppose the allowance for salaries to be the relatively high one of \$140,000. Shall the institution have a staff of 80 at an average salary of \$1,800, or a staff of 60 at an average salary of \$2,400, or a staff of 40 at an average salary of \$3,600, with consequences as before to the amount of teaching of each member of the staff, or to the variety of the courses offered to the students?

The figures concerning the number of students per instructor strongly support

the criticism that the American colleges and universities are offering too many courses. One three-thousand-dollar man teaching a class of thirty-six students probably means better progress in education than two fifteen-hundred-dollar men each teaching eighteen of the thirty-six. With a given sum to spend and a given number of students, salaries can be increased only by diminishing the number of courses taught by an individual. Either of these alternatives seems preferable to leaving salaries at their present low level, and the former seems feasible without any alarming loss in the adequacy of college curricula to the need of college students.

One may well hesitate to oppose any widening of the scope of an institution's offering in science and letters. But the educational welfare of the students is in the long run more dependent on the quality of the teaching profession than on all other causes. And the increase of courses is not mainly due to greater needs of the student body. On the contrary, it may be irrational.

The professor at the head of a department is usually a specialist zealous for the subject he loves, not interested in and unacquainted with the facts of university economy. He is eager to see his department flourish and to that end adds courses. He dislikes to have a student wish for a certain course in his junior year because it is for economy given only biennially. Often he fails to appreciate that biennial courses may mean a doubled salary allowance per man. He does not feel quite justified in demanding a greater salary for himself, even though he is wasting the university's energy in copying quotations, building fires, and hunting about the town for a cheap tailor. But he feels it his duty to beg for an additional man in the department. He is, perhaps, conscious that better men, and hence higher salaries, must be the means of advancing his or other departments in the long run, but whenever the question is provisionally raised he tends to take the line of least resistance and ask for an addition which will not bring up the question of raising the institution's scale of salaries.

The college president, while more appreciative of the general issue, tends likewise to take the line of least resistance. A thousand dollars five times is easier to ask for than five thousand dollars once. Ever hoping that the financial authorities will follow his broad recommendations to raise the salary schedule, he makes specific recommendations for increasing the number of courses, which in the end make consent to his appeal for a higher schedule impossible. Moreover he, too, is ambitious for the growth of his institution; he loves to see it do every desirable thing that other institutions do; he finds it easier to get more courses than to get better men.

In some cases there has been on the part of heads of departments and heads of colleges nothing less than a passion to increase the variety of courses and the size of the staff. A course is given though only five out of a thousand students take it, and though these five would probably be as much profited by some other course already offered. Yet to give that course is to withhold an increase of

twenty or twenty-five per cent. to some individual's salary. No institution for higher education in this country should, with its present salary schedule, increase its programme of studies except after most careful consideration.

There has also been an insufficient coöperation between departments and between institutions. If all the departments of an institution would agree to ask for no added appropriation for five years on condition that the salary schedule be then raised by a certain amount, the president could recommend a rise in quality as an alternative to a rise in number. In many things institutions might profitably coöperate. There does not seem, for example, any necessity for two universities in the same city to give courses in Syriac. Even where large universities are separated by several hours' journey, they might well consider whether each of them should give courses in Icelandic, in Pali, and in Old Portuguese. A division of labor might well be arranged in such subjects.

Indeed this division of labor could be extended with profit into wider fields than a few recondite courses. If different institutions would coöperate, whereby one would provide an elaborate programme of studies for graduate students in say the physical sciences, another a similar specialization in the mental sciences, and another similarly for the modern languages and literatures, and so on, there might be a decided gain for the welfare of American education as a whole. There would certainly be a gain in the pecuniary rewards of American professors.

TENURE OF OFFICE AND THE METHOD OF APPOINTMENT IN AMERICAN COLLEGES AND UNIVERSITIES

The security of the teacher's place and his tenure of office in American colleges vary with the character of the college to which he gives his service. The principle that good teachers can be had only in institutions where tenure of place was secure has been a lesson learned by American institutions in comparatively recent times. Even now at state institutions political interference is sufficiently strong sometimes to turn out a president.

In the stronger American colleges and universities tenure of office is to-day secure during faithful performance of duty on the part of the professor. In the better state universities this is also true, and the weaker state institutions will unquestionably follow the example of their stronger neighbors as fast as the political and intellectual standards are raised. The security with which a teacher may hold his place and yet express frankly his honest opinion is perhaps the best criterion of the strength and intellectual fibre of a college or a university and of the civilization of its region. Satisfactory as our progress has been in the better institutions in this matter, we have not yet given to the teacher the measure of security and independence of expression which he has in some European universities. For example, it is not an uncommon thing for a German university professor, standing in the parliament, to criticise the educational policy of the government itself and the appropriations which are made for educational purposes. One can imagine how long a professor in an American state university would hold his place if, as a member of the state legislature, he undertook to criticise the appropriations for his own university, or still more, if he criticised its educational policy.

Appointments of professors are made in the United States by the trustees, as a rule, upon the recommendation of the president. Dismissals come, usually, in the same way. This power in all the better American colleges and universities has, for many years past, been used with great caution. Very rarely have professors been dismissed from good colleges or universities in the past twenty years except upon the ground of evident incompetence or indifference or lack of moral character. There is nothing in the system of American college and university administration which provides for the removal of a professor except in this way. Too often a president must choose between retaining an incompetent and indifferent man, with great injustice to the student body, and an

arbitrary dismissal, an action which is itself a blow at that sense of security of the teaching staff which he desires especially to guard.

In hundreds of the weaker institutions in this country calling themselves colleges, the teacher's tenure of place is as insecure as could well be imagined. Such institutions are, of course, not colleges in any true sense and there is no surer mark of a wholesome, efficient, and scholarly institution than the care with which it chooses its professors and the security, freedom, and dignity which it guarantees to them when once chosen.

The question of the method of appointment of men to places requiring a high degree of skill and a wide range of culture is difficult and no method has probably been devised which insures that the right man may always be chosen. The objection to the choosing of professors by a president, even assuming a consultation with his immediate advisers, is open, among other objections, to the very serious one that the choice is usually narrowed to a limited number of persons when there might be men excellently qualified whose names are never mentioned. In obtaining men for high technical places under the Federal government through the Civil Service, chiefs of division are often surprised at the discovery of men who had been hitherto entirely unknown outside of their own regions, but of a very high order of ability.

The effort made to overcome this difficulty which has been adopted in the choosing of professors in the Italian universities and which has shown excellent results is the following.

When a vacancy occurs in a professorship in an Italian university, the Minister of Public Instruction advertises the vacancy in the journal of the department and bulletins announcing the existence of the vacancy are posted in universities or in other places likely to attract the notice of possible candidates. Any person may apply for the position. His application must be accompanied by certain biographical information, together with a complete statement of his record as a teacher and of his scientific or literary activities. His publications must accompany the application. All applications must be made within a certain date.

In order to decide between the applicants, a jury is selected, the faculty of each university in the country being invited to vote for members of the jury, these being necessarily professors of the same subjects or of a kindred subject to that in which the vacancy occurs. Each faculty votes for five jurors. The Minister of Public Instruction chooses five names from amongst ten having the highest votes. The applications of the candidates are then turned over to this jury. They report to the Minister three names in the order of merit and the appointment is offered to the first; if he refuses, to the second; and if he refuses, to the third.

It should be mentioned that in exceptional cases the faculty of the institution in which the vacancy occurs may request the filling of the vacancy

by a direct call to another professor of the same subject in another university.

In sharp contrast to this method of choice there has been developed in nearly all American institutions a system of inbreeding under which young graduates are appointed assistants, and then advanced to instructorships, and later are promoted to the faculty.

RETIRING ALLOWANCES IN AMERICAN COLLEGES AND UNIVERSITIES

Before the inauguration of the Carnegie Foundation for the Advancement of Teaching, retiring allowance systems had been inaugurated in a few of the older and stronger American universities, notably at Harvard, Yale, Columbia, and Cornell. The College of the City of New York also gave liberal retiring allowances. A fund had been given to Williams College for this purpose, but a system of retiring allowances had not been put into actual use. The plans in use in these institutions were given in the First Annual Report of the President of the Foundation.

The object of any rightly constructed system of retiring pay for teachers is to strengthen and to dignify the teacher's calling. Desirable as it is to increase salaries, it is evident that the pay of teachers, even in the best colleges, can never be made comparable with those in business life. If, however, with this modest scale of pay no provision is made against the uncertainties of ill health, the weakness of old age, and the needs of those dependent upon the teacher, many men whose scholarly instincts would carry them into the teacher's calling will decline to enter it. No fact has been more evident in the educational experience of colleges and universities in the United States during the past ten or fifteen years than this tendency. Men who came from good homes, of high social position, with strong ambitions, were those least likely to accept the uncertainties of the teacher's life, even when their inclinations led them in this direction.

The institution of a system of retiring allowances in any college goes far to remove the causes which prevent such men from entering the teaching profession. A man will reconcile himself to a modest income, if he may have lifted from his shoulders at the same time the uncertainties which go with it.

In order to fulfil this purpose a retiring-allowance system should carry with it a fair retiring salary at the end of a specified service or at a certain age. It should be able to provide an emergency salary for a longer or shorter period of time in case of physical breakdown, and it should provide a fair proportion of the retiring pay due to a teacher as a pension for his widow.

The system of retiring allowances established by the Carnegie Foundation in the various institutions which have been thus far accepted embraces these three features. Retiring allowances in these institutions are obtained as a right after certain service, not as a matter of courtesy. The following rules indicate

the conditions upon which the retiring allowances are granted, whether on the ground of service or of age:

1. Any person sixty-five years of age, who has had not less than fifteen years of service as a professor and who is at the time a professor in an accepted institution, shall be entitled to an annual retiring allowance computed as follows:

(a) For an active pay of twelve hundred dollars or less, an allowance of one thousand dollars, provided no retiring allowance shall exceed ninety per cent. of the active pay.

(b) For an active pay greater than twelve hundred dollars the retiring allowance shall equal one thousand dollars, increased by fifty dollars for each one hundred dollars of active pay in excess of twelve hundred dollars.

(c) No retiring allowance shall exceed four thousand dollars.

2. Any person who has had a service of twenty-five years as a professor and who is at the same time a professor in an accepted institution, shall be entitled to a retiring allowance computed as follows:

(a) For an active pay of twelve hundred dollars or less, a retiring allowance of eight hundred dollars, provided that no retiring allowance shall exceed eighty per cent. of the active pay.

(b) For an active pay greater than twelve hundred dollars the retiring allowance shall equal eight hundred dollars, increased by forty dollars for each one hundred dollars of active pay in excess of twelve hundred dollars.

(c) For each additional year of service above twenty-five, the retiring allowance shall be increased by one per cent. of the active pay.

(d) No retiring allowance shall exceed four thousand dollars.

3. Any person who has been for ten years the wife of a professor in actual service shall receive during her widowhood one half of the allowance to which her husband would have been entitled.

In case of disability or physical breakdown, each case is treated on its own merits.

Up to May, 1908, the following sixty colleges and universities had been admitted to the benefits of the retiring-allowance system as established by the Carnegie Foundation for the Advancement of Teaching:

Amherst College	Amherst, Massachusetts
Bates College	Lewiston, Maine
Beloit College	Beloit, Wisconsin
Bowdoin College	Brunswick, Maine
Carleton College	Northfield, Minnesota
Case School of Applied Science	Cleveland, Ohio
Central University of Kentucky	Danville, Kentucky
Clark University	Worcester, Massachusetts
Clarkson Memorial School of Technology	Potsdam, New York
Colorado College	Colorado Springs, Colorado
Columbia University	New York City
Cornell University	Ithaca, New York
Dalhousie College and University	Halifax, Nova Scotia
Dartmouth College	Hanover, New Hampshire
Dickinson College	Carlisle, Pennsylvania

Drake University	Des Moines, Iowa
Drury College	Springfield, Missouri
George Washington University	Washington, D. C.
Hamilton College	Clinton, New York
Harvard University	Cambridge, Massachusetts
Hobart College	Geneva, New York
Iowa College	Grinnell, Iowa
Johns Hopkins University	Baltimore, Maryland
Knox College	Galesburg, Illinois
Lawrence University	Appleton, Wisconsin
Lehigh University	South Bethlehem, Pennsylvania
Leland Stanford Junior University	Stanford University, California
McGill University	Montreal, Quebec
Marietta College	Marietta, Ohio
Massachusetts Institute of Technology	Boston, Massachusetts
Middlebury College	Middlebury, Vermont
Mount Holyoke College	South Hadley, Massachusetts
New York University	New York City
Oberlin College	Oberlin, Ohio
Polytechnic Institute of Brooklyn	Brooklyn, New York
Princeton University	Princeton, New Jersey
Radcliffe College	Cambridge, Massachusetts
Randolph-Macon Woman's College	Lynchburg, Virginia
Ripon College	Ripon, Wisconsin
Rose Polytechnic Institute	Terre Haute, Indiana
Smith College	Northampton, Massachusetts
Stevens Institute of Technology	Hoboken, New Jersey
Trinity College	Hartford, Connecticut
Tufts College	Tufts College, Massachusetts
Tulane University of Louisiana	New Orleans, Louisiana
Union University	Schenectady, New York
University of Pennsylvania	Philadelphia, Pennsylvania
University of Rochester	Rochester, New York
University of Vermont	Burlington, Vermont
Vassar College	Poughkeepsie, New York
Wabash College	Crawfordsville, Indiana
Washington and Jefferson College	Washington, Pennsylvania
Washington University	Saint Louis, Missouri
Wellesley College	Wellesley, Massachusetts
Wells College	Aurora, New York
Western Reserve University	Cleveland, Ohio
Western University of Pennsylvania	Pittsburgh, Pennsylvania
Williams College	Williamstown, Massachusetts
Worcester Polytechnic Institute	Worcester, Massachusetts
Yale University	New Haven, Connecticut

From these sixty institutions one hundred and six professors and eighteen widows of professors are to-day being carried upon the retiring-allowance roll at an annual cost of \$185,770. This does not represent the total load which will

eventually come from these institutions upon the retiring-allowance funds because the institutions have not as yet availed themselves of the average number of retirements which they are likely in the future to make. In addition to these professors and widows of professors from the accepted institutions named above, there are also upon the list of the Foundation to-day a number of other names from institutions not upon the accepted list, cases in which the Foundation has dealt directly with the professor, not with the institution.

It is a part of the work of the Carnegie Foundation for the Advancement of Teaching to make the retiring allowance system a part of the American system of education, and it may be fairly inferred from the short history which it has already had that this end is likely to be accomplished. One cannot say at this moment how many institutions it will be possible to include in the list entitled to share in the benefits of the retiring-allowance system, but the number will probably be so large that any college or university which cannot, for one reason or another, be admitted to the system of retiring allowances established by the Carnegie Foundation must, to retain good teachers, establish its own system of retiring allowances upon a similar plan. When once this has been instituted in the colleges and universities of the United States and of Canada as a part of the regular system of education, another step will have been taken in obtaining that greater dignity and security for the teacher's calling which is necessary to attract to its service the best men.

THE AMOUNT OF TEACHING DEMANDED OF A PROFESSOR

The amount of teaching which institutions of different grades calling themselves colleges or universities exact of a professor, an assistant professor or an instructor, varies so greatly with the standards of the institution and the status of education in its region that it is impossible to give any complete statement concerning it without a full list of the professors of each institution, the number of recitation periods and the amount of laboratory work assigned to them. In general it may be said that the full professor in the stronger universities is called upon to give from six to twelve hours a week of lectures or recitations, counting two hours of laboratory or seminar exercises as equivalent to one hour of lecture or recitation. In the better smaller universities and colleges from twelve to fifteen hours a week of lectures and recitations are counted as the ordinary work of a professor. In a number of institutions as many as twenty-five hours a week of recitations and lectures are demanded. Such excessive demands upon the professor are invariably associated with low standards, the effort for numbers and the widespread attempt in American colleges to give instruction in every conceivable study. The number of teaching hours a week imposed upon the teacher and the amount of administrative detail added to them are directly related not only to the question of good teaching but also to the possibilities of the teacher for study, for growth, and for scholarly productiveness. The present bulletin was compiled from data dealing with the financial status of the teacher in the higher institutions. A statement concerning matters relating to the scholarly status of the professor will be prepared later.

THE FINANCIAL STATUS OF THE UNIVERSITY PROFESSOR IN GERMANY

ORGANIZATION OF GERMAN UNIVERSITIES

All the German universities are government institutions. Like the primary schools and the *gymnasias*, the university is part of the educational system of that German state in which it is located.* The professors are officials of the sovereign, and the major part of the university revenues are derived from the state treasury. The government of the university is, in the last resort, in the hands of the sovereign's Minister of Education, who in the constitutional monarchies is responsible to the Chambers, and in Mecklenburg-Schwerin, to the Grand Duke.

The university is thus under the control of the state Parliament and, according to the laws enacted by it, under the immediate supervision of the Minister of Education. The university budget must be passed each year by the Chambers; the creation of a new chair can only be by parliamentary approval. The appointment of professors rests with the sovereign or his minister, and the scheme of instruction together with the entire educational policy of the university is a matter of state control. As will be seen hereafter, however, this is compatible with a very large measure of professorial freedom and self-government.

As the Minister of Education has charge of the entire school system of the state and is generally also minister of ecclesiastical affairs and several other important branches of government supervision, it is impossible for him to give any minute personal attention to the details of university management. When the annual university budget is before Parliament, or Parliament is discussing any bill affecting the university, he is, of course, in his place as the spokesman of the government, and when university matters must be laid before the sovereign, it is he who is granted an audience by the King or reigning Grand Duke. But while any changes in university policy must be considered by the minister and he is responsible for them, the actual management of university interests generally rests with the permanent officials of the bureau of the ministry which is directly charged with university affairs. The director of that

* The University of Jena, although within the dominions of the Grand Duke of Saxe-Weimar, is also under the control of the Duke of Saxe-Meiningen, the Duke of Saxe-Altenburg, and the Duke of Saxe-Coburg-Gotha, as Duke of Gotha. The University of Strassburg is in the Reichsland of Alsace-Lorraine, which is analogous in its political status to a territory in the United States.

bureau is therefore often a person of great influence, Director Althoff of the Prussian Ministry having had a power in moulding the Prussian universities and, through their example, the universities of the other German states, which is likely to become historic.

At each university the ministry is represented by a commissioner who has charge of the economic side of the academic administration, and acts as the general advisory agent of the government, conducting the correspondence of the university with the ministry. At the Prussian universities, and at the University of Jena and the University of Strassburg this official is called the curator. At the University of Leipzig he is styled the government plenipotentiary; at the University of Tübingen the chancellor, and at the University of Rostock the vice-chancellor, the title of chancellor at Rostock being borne by the reigning Grand Duke. The Ministry of Instruction of Prussia itself attends to the curatorial business at the University of Berlin, assisted by the rector and the university judge.

The curator is a trained jurist or administrative official who has charge of the erection of buildings, the management of the special scholarship funds, and of all those administrative functions, apart from the direct supervision of the instruction, which in the United States are vested in the university president under the general direction of the board of trustees. The tenure of office of the curator is a fairly permanent one.

The titular executive head of a German university is the rector, elected by the full professors (at the University of Göttingen and at the Bavarian universities by the associate professors also) from among their own number for one year, with the approval of the reigning sovereign. The rector represents the university on occasions of ceremony, presides over the senate, is in control of the university officials, of matriculation, and of all meetings and societies of students, and in general transacts the current business of the institution. The rector is never re-elected, the office being held in rotation by the full professors. At the Universities of Erlangen, Freiberg, Göttingen, Heidelberg, and Jena, the above duties are performed by a Prorector, and at Giessen and Leipzig by the *Rector Magnificus*, these seven universities having as their titular executive a *Rector Magnificentissimus*, who is at Erlangen the King of Bavaria, at Leipzig the King of Saxony, at Freiburg and Heidelberg the Grand Duke of Baden, at Giessen the Grand Duke of Hesse, at Jena the Grand Duke of Saxe-Weimar, and at Göttingen a prince of the royal house of Prussia.

The distinguishing characteristic of the German university is the power of the full professor (*ordentlicher Professor*). In American universities the professor is simply the highest in rank of an ascending series of teachers. Like the instructors and assistants, he is appointed by a board from which all teaching officials are excluded and he holds his office during the pleasure of that board. Unless he occupies an endowed chair, his salary is generally the result of a bar-

gain with the university president. The professor, indeed, sits as of right in the faculty, which determines the number of courses in the curriculum and regulates the activities of the student body, but seldom is an American faculty asked to propose candidates for vacant professorships.

In Germany the professors are practically the university. The professor, to borrow Anglo-Saxon legal terminology, holds his office as a freehold. Buildings are for the professors to lecture in and subordinate teachers are for the relief of the professors from the less important parts of instruction. The professor decides for himself how he will best serve the students; the body of professors settles such general university matters as in their nature cannot be left to individual control. Each university is subject, as are all other institutions in the land, to the control of the sovereign advised by the representatives of his people. But no intermediate non-academic board is interposed between the ultimate authority of the crown and the plenary academic authority of the professors, and the rector, elected by the professors and serving a limited term, has powers analogous to those of the presiding officer of a legislative body; while the powers of an American college president resemble those of the president of a railroad. It must, however, be kept in mind in making any such comparison that the business life of a German university is conducted by the government, through the Minister of Education. The problem of ways and means does not confront the rector and the professors. It is the ever present demand for money which has gone far to transform the American university organization into a business corporation, as differentiated from a teaching body.

A German university ordinarily consists of the four faculties of philosophy, theology, law, and medicine. At the Universities of Bonn, Breslau, Strassburg, and Tübingen there are both a Roman Catholic theological faculty and a Protestant theological faculty.* The Universities of Heidelberg and Strassburg have a separate faculty of mathematical and natural science and the University of Tübingen, besides this faculty, has also a faculty of political economy. The University of Munich likewise has a faculty of political economy and its faculty of philosophy is in two separate divisions,—classical-historical and mathematical-scientific.† The University of Münster is the one German university having but three faculties, lacking that of medicine.

Each of these faculties is composed of the full professors holding chairs therein. The faculty confers the degrees to which its courses lead, gives (except in Bavaria) to promising young scholars the privilege of acting as *Privat-Dozenten* in the university, proposes candidates for vacant professorships, and in general takes such action on matters pertaining to instruction within the faculty

* In the Universities of Freiburg, Munich, Münster, and Würzburg the theological faculties are Roman Catholic; elsewhere they are Protestant.

† In the Universities of Freiburg, Münster, Strassburg, and Würzburg political economy is studied under the faculty of law.

as it is inappropriate to leave to the individual professor. The faculty is presided over by the dean, elected each year. The election of the dean must usually be confirmed by the Minister of Instruction. The teaching staff consists of full professors (*ordentliche Professoren*), associate professors (*ausser ordentliche Professoren*), lecturers below professorial rank (*Privat-Dozenten*), with numerous laboratory assistants, and helpers (*Diener*).

At the Universities of Erlangen, Jena, Marburg, and Tübingen, the entire number of full professors, in all the faculties, make up the senate of the university. This is the general legislative body of the institution. In the other universities the senate is composed of the rector and his immediate predecessor, the university judge, the deans of the several faculties, and a certain number of professors elected each year by the entire professorial body. The Universities of Freiburg, Giessen, and Heidelberg, in addition to this smaller representative senate, have also a senate consisting of all the professors, which deals with general disciplinary and administrative matters not referred to the higher body. The Universities of Greifswald, Halle, Kiel, Königsberg, and Rostock call this full gathering of the professors the Consistory, or the General or Academic Council.

When a vacancy occurs in a professorial chair, the general usage is for the faculty to submit candidates to the reigning sovereign, who either approves one of those proposed or by the exercise of his prerogative appoints a scholar of his own selection. The exact details of these nominations and the frequency with which they are disregarded by the sovereigns differ in the several states. In Prussia, although the faculty concerned has the right to submit three names to the King, the King often makes an independent choice. In Bavaria the faculty sends three names to the senate of the university, and in Württemberg four names, the nominees being arranged in order of preference. The university senate considers the nominations and, having altered them if it sees fit, forwards the list through the minister to the King. It is seldom that either the King of Bavaria or the King of Württemberg does not make the appointment from one of these nominees. In Baden the senate of the university can append a report to the three names, arranged in order of preference, which have been nominated by the appropriate faculty, but cannot change the nominations. The grand-ducal Minister of Instruction then makes the selection himself without referring the matter to the Grand Duke, and it is very unusual for another than one of the faculty nominees to be chosen.

When a new chair is created at a university, the final decision whether it is to be a full professorship or an associate one rests with the legislature of the state (or in Mecklenburg-Schwerin with the Grand Duke) at the time of considering the annual budget. Of course, the proposals of the ministry generally receive the assent of the Chambers. A regular professorship is maintained indefinitely, but occasionally personal professorships are created which expire when the occupant of the chair ceases to exercise the functions of a professor.

In Prussia, when a chair is to be filled for the first time, the crown does not ask the faculty in which it is to exist for nominations.

The procedure in the selection of associate professors is generally the same as that which prevails in respect to full professors, except that the Minister of Instruction himself acts upon the nominations of the faculty. The honor of an appointment coming technically from the reigning sovereign is usually reserved for the full professor.

The professor, when appointed, is required to announce one public or free lecture course of one hour each week. He must also announce one private or fee lecture course, which may be from two to six hours weekly. These are the only obligations resting upon him. Other fee lecture courses he can announce at will. The professor has entire freedom in arranging his courses and choosing his own lecture subjects. He naturally confines himself to subjects germane to the chair which he occupies and to whose study he has devoted his life, but there is usually nothing in the university regulations which would prevent him from lecturing on any subject he might desire.

The preliminary step necessary to render a scholar eligible for a professorship is for him to secure from a faculty "habilitation," or admission to the privileges of a privat-docent (*venia legendi*). The privat-docent is not an officer of the government, as are the professors, nor does he receive any salary from the university. His "habilitation" means that he is permitted to give lectures in the university to such students as are willing to pay fees therefor, and that the universities will give to students taking such courses the same credit as if the courses were those of a professor.

In Prussia the "habilitation" of the privat-docent rests entirely with the faculty, the ministry of instruction simply signifying through the curator that the royal government has no objection to the candidate. The privat-docent is not required to lecture unless he sees fit, but his name will be dropped from the announcement of lectures if for two successive semesters he fails to give courses. In Bavaria, the King, through the ministry of instruction, grants to a privat-docent the *venia legendi* and he may be removed at will by the royal command. He must conduct each year one course. In Saxony, Württemberg, and Mecklenburg-Schwerin, the consent of the ministry is necessary for an "habilitation"; in Hesse the rector of the university grants the privilege with the consent of the university senate; and at the University of Jena it is necessary, before a docentship is conferred, to obtain the consent of the Grand Duke of Saxe-Weimar and the reigning Dukes of Saxe-Meiningen, Saxe-Altenburg, and Saxe-Coburg-Gotha. In the Roman Catholic theological faculties an "habilitation" must receive the sanction of the bishop of the diocese.

The requirements for an "habilitation" have been constantly rising in recent years, and the average age at which a scholar acquires this privilege is well above thirty. Although instances of large fees by privat-docents have

existed, the largest practical possibility is from four to five hundred dollars a year. The average income is certainly not much above two hundred dollars. Students have a strong tendency to pay their fees for the lectures of the better known professors, and the situation to-day of the privat-docent who does not possess a private income or is without the backing of wealthy relatives remains the same as when Herr Teufelsdröckh climbed his many flights of stairs at the University of Weissnichtwo. Nor is there any sure hope of a professorship to solace their years of financial barrenness. A chair in the faculty may never come at all; even if it is attained, the period of waiting is beyond calculation. Probably the situation is more difficult than it was when Kant remained a privat-docent at the University of Jena until he was forty-six.

When a man, however, has been commissioned a full professor or an associate professor in a German university, he has attained a financial status which, although it varies widely, is certain to be well within the margin of comfortable living. His income is a total usually composed of (1) a salary attached to his professorship, (2) a personal supplement, (3) a residence or a residence indemnity, (4) all or part of the fees paid by students for his courses, and (5) a part of the more general fees paid by students to the university (faculty fees, examination fees, diploma fees, etc.). The receipts from fees are a very important proportion of the total income of the professor, often far exceeding all the other sources of income combined.

The Carnegie Foundation for the Advancement of Teaching has secured from the governments of the Kings of Prussia, of Saxony, and of Württemberg, from the government of the Grand Duke of Baden, and from the university authorities a statement of the individual incomes in 1906, from each of the above mentioned five sources, of the full professors and the salaried associate professors (*etatsmässig ausser ordentliche Professoren*) in thirteen universities. These thirteen universities are the ten Prussian universities of Berlin, Bonn, Breslau, Göttingen, Greifswald, Halle, Kiel, Königsberg, Marburg, and Münster, the University of Leipzig (Kingdom of Saxony), the University of Tübingen (Kingdom of Württemberg), and the University of Freiburg (Grand Duchy of Baden).

It is only upon such statements of individual incomes that any final account of the financial status of a professor can rest, and the Carnegie Foundation takes this opportunity to express its thanks for the courteous and efficient coöperation of the governments of the German sovereigns and of the German universities which has enabled the Foundation to secure these detailed individual incomes. It is to be regretted that they cannot be published, but it was not thought wise to present the facts concerning individuals even though no names should be stated. Only averages will be given.

To the statement of income directly resulting from the teaching is added in each case on our lists a statement of income from other governmental employments. This secondary income varies in its nature from what is really a

civil-list pension from the sovereign to the professor to a distinct outside salary for outside work, such as the professor might earn by private tutoring or the practice of a profession. These additions to income will not be considered in any of the text or tables that follow unless a special statement to that effect is made.

GOVERNMENT SALARY SCHEDULES IN THE UNIVERSITIES OF THE DIFFERENT GERMAN STATES

Below will be found the salary schedules for full professors which have been adopted by the different German governments. These salaries are simply the guarantees which the government gives to the professor, and constitute only a small proportion of the total professorial income. Following the account of these government appropriations to the professorial chairs will be a table giving the total academic income of the full professor in German universities, and some discussion thereon. It is with these later figures that the salary of the American professor must be compared.

KINGDOM OF PRUSSIA.—In 1897 the royal government presented to the professors in all the Prussian universities a contract and invited their signatures. According to this contract the professor was to give up to the kingdom one-half of all the fees in excess of 3,000 marks (\$713), except at the University of Berlin, where the surrender was of one-half of the fees above 4,500 marks (\$1,069). This calculation of 3,000 and 4,500 marks was not to include the commission of the "Quaestus" for collecting the fees. The professor was to receive these sums of 3,000 and 4,500 marks net. Professors appointed in 1897 and afterwards were required to sign this contract. In exchange the royal government promised to arrange the salary schedule so that there should be an increase in the professor's salary proportional to his length of service, and guaranteed a minimum income of fees of 800 marks (\$190) from lecture fees, examination fees, and promotion fees, to all of the full professors and the associate professors alike. Many professors whose fees were greatly in excess of 3,000 marks, or 4500 marks at the University of Berlin, declined to accept the government's invitation. According to Professor Biermer, only 361 out of the 738 *etatsmässig* professors in the Prussian universities agreed at once to the proposal. For the others there was thus no regular increase of salary as their period of service lengthened. But many of the professors who at first refused have since given their adhesion to these regulations, and as all of the appointees since 1897 are under its provisions, the plan may now be considered as the normal arrangement in the Prussian universities.

Under the salary schedule thus in force since 1897, the theory is that a full professor begins his service with an annual government salary of \$950; at the University of Berlin \$1,040. Thereafter there is an increase of \$95 every four

years until in twenty years a maximum of \$1,425 is reached; at the University of Berlin a maximum of \$1,711 in twenty-four years. At the discretion of the royal Ministry of Public Instruction the maximum may be raised in special instances to \$1,853—at the University of Berlin to \$2,233. With the approval of the King the respective maxima may go even higher, and at the University of Berlin it is now \$3,563.

Associate professors in the Prussian universities begin usually at an annual salary of \$475—at the University of Berlin \$570. Their salaries are advanced in the same manner by \$95 every four years until the maximum of \$950 is reached in twenty years,—at the University of Berlin \$1,140 in twenty-five years. An associate professor, like the full professor, may likewise receive a special guarantee of fees, or a special salary supplement.

In Prussia each full and salaried associate professor receives an additional sum of money each year as a "residence indemnity," granted quite generally to all the higher civil servants of the King, because of the greater cost of living in the cities. The Universities of Berlin and of Breslau (which has recently been raised to the same class as Berlin) fix this residence indemnity at \$214 annually. At the Universities of Bonn, Halle, Königsberg, and Kiel it is \$157, and at the Universities of Göttingen, Greifswald, and Marburg it is \$128.

KINGDOM OF BAVARIA.—About fifteen years ago the Bavarian government adopted a new salary scale for the university professors, whereby their incomes are considerably augmented. A full professor now commences with a government salary of \$1,083 (4,560 M.). At the end of each of three periods of five years \$85 (360 M.) are added to the salary, and thereafter the increment is \$42 (180 M.) at the end of each period of five years. An associate professor usually commences with a government salary of \$756 (3,180 M.), receiving the same increases as the full professor. The salary scale is as follows:

	Full Professor	Associate Professor
To commence.....	\$1,083 (4,560 M.)	\$756 (3,180 M.)
After five years' service.....	1,168 (4,920 M.)	841 (3,540 M.)
After ten years' service.....	1,255 (5,280 M.)	926 (3,900 M.)
After fifteen years' service.....	1,340 (5,640 M.)	1,013 (4,260 M.)
After twenty years' service.....	1,383 (5,820 M.)	1,055 (4,440 M.)
After twenty-five years' service.....	1,426 (6,000 M.)	1,098 (4,620 M.)
After thirty years' service.....	1,470 (6,180 M.)	1,140 (4,800 M.)
After thirty-five years' service.....	1,512 (6,360 M.)	1,183 (4,980 M.)
After forty years' service.....	1,555 (6,540 M.)	1,227 (5,160 M.)
After forty-five years' service.....	1,598 (6,720 M.)	1,264 (5,340 M.)
After fifty years' service.....	1,640 (6,900 M.)	1,312 (5,520 M.)

In addition to the above there is also the residence indemnity—called in Bavaria "salary supplement"—of \$127 (540 M.) for full professors, and \$99

(420 M.) for associate professors. Besides this, there is a further residence indemnity—called “local supplement” in Bavaria—which was added a few years ago because of the increased cost of living. This amounts to \$64 (270 M.) at the Universities of Munich and of Würzburg—in cities of the “first class”—and to \$54 (225 M.) at the University of Erlangen—in a city of the “second class.” In case the fees of a professor amount to more than \$286 (1200 M.) in one year his residence indemnities for that year are cancelled. If the fees do not amount to \$286, so much of the residence indemnities is paid to the professor as is necessary to bring the total up to \$286.

GRAND DUCHY OF HESSE.—A full professor at the University of Giessen begins his service with an annual government salary of \$1,069. This is increased every four years by \$95 until in twenty years the maximum of \$1,544 is attained.

The associate professor is appointed at an annual salary of \$595 (2,500 M.) and after each period of four years' service \$71 (300 M.) is added annually. The maximum is \$950 a year. Very recently the grand-ducal government has authorized a residence indemnity. This is calculated on the basis of eight per centum of the maximum salary, and is therefore \$123 (520 M.) a year for the full professor and \$75 (320 M.) for the associate professor. There is in addition a special fund, amounting at present to \$2,350 a year, at the disposal of the Grand Duke's Minister of the Interior for the purpose of adding supplements to individual salaries.

GRAND DUCHY OF SAXE-WEIMAR.—Until 1902 government salaries at the University of Jena were very meagre, the professors being released from all payments of taxes, however, whether grand-ducal or communal. In 1902 there was a salary reform, a schedule being introduced on the Prussian model, optional as regarded the holders of professorial chairs at that time. About one-fourth of the professors adhered to the old arrangement. Those who accepted the change and all professors appointed since are liable like other subjects to taxes, all of the grand-ducal taxes so collected and one-third of the communal taxes going, however, into the treasury of the university. In return for this the full professor begins his service at an annual government salary of \$950 which is raised every four years until in twenty years he receives \$1,425. The associate professor receives a similar increase in the same periods, his annual salary beginning at \$475 and reaching in twenty years \$950. A part of this increase in the university salary schedules was made possible by the income of the Karl Zeiss Foundation, which is now annually \$7,130. The grand-ducal government of Saxe-Weimar, the ducal governments of Saxe-Meiningen and Saxe-Altenburg, and the Gotha duchy of the reigning Duke of Saxe-Coburg-Gotha also contributed a similar amount. These four governments jointly have royal rights over the university.

GRAND DUCHY OF MECKLENBURG-SCHWERIN.—The full professors at the University of Rostock begin with a government salary of \$998 (4,200 M.), and

receive a \$95 increase at the end of the second and fourth years of service. Thereafter there is an increase of \$95 every four years until at the end of twenty years of service the maximum of \$1,568 is reached.

The associate professor at the University of Rostock commences with a salary of \$570. After three years there is an increase of \$71, and thereafter the like increase at the end of each four years. The maximum government salary of \$856 is attained at the end of fifteen years' service.

At present, the average government salary for full professors at the University of Rostock is \$1,321. By faculties, the averages are as follows: theology, \$1,473; law, \$1,654; medicine, \$1,179; philosophy, \$1,249. The averages in theology and law are much above the similar figures for Prussia. The associate professors in the theological and in the law faculty (there is but one each), and the honorary professor of the medical faculty, receive government salaries of \$641. The average for associate professors in the philosophical faculty is \$615.

KINGDOM OF WÜRTTEMBERG.—At the University of Tübingen the full professor usually commences at \$950 government salary annually, and is advanced at the end of every three years \$119. Four such three-year promotions are allowed. Salary supplements are granted by the royal Minister of Public Education and sometimes these supplements equal two-thirds of the regular government salary. A newly appointed professor may begin his service with one of these large supplements.

The associate professors are appointed at \$570 a year, and every three years receive an increase in salary of \$71. There may be five of these advances. There are now but two associate professors at the University of Tübingen receiving personal salary supplements from the royal government, promotion to the rank of full professor being the usual reward for distinguished service.

The University of Leipzig (Kingdom of Saxony) has no government salary schedule, the salary being arranged in each case between the professor and the royal Minister of Education. The grand-ducal Minister of Instruction makes a similar arrangement with the professors in the Baden Universities of Freiburg and Heidelberg, and at the University of Strassburg each professor's government salary is likewise the result of negotiation with the Minister of Instruction of the Reichsland.

TOTAL INCOMES OF FULL PROFESSORS

Table XI gives the facts concerning the total professorial incomes of the full professors in the German universities. The incomes range from \$1,000 a year to over \$10,000, with three professors receiving incomes above that figure. Up to \$10,000 the incomes have been segregated, as a convenient division, into two-hundred-dollar groups.

The table shows that a fourth of the incomes are below \$2,100, while, on the other hand, a fourth are over \$3,200, a trifle short of a half being over \$2,500. The most frequent income is one between \$1,600 and \$2,000. The average is \$2,800, but this does not represent the typical income, because, like most averages in financial statistics, it is a result of the compounding of many moderate deviations downwards with fewer, but larger, deviations upward.

One of the most significant facts disclosed by this table is the wide variability of the professorial income. On account of the salary schedules announced by their respective governments for all except four of the German universities, these universities give at a superficial glance an aspect of uniformity and rigidity. The truth is far otherwise. There is a much greater variation in income to suit individual merit than is the case with comparable institutions in the United States. It will be seen from Table XI that in Germany the best paid full professor receives ten times as much as the least paid professor and that the highest income from professorial teaching is more than four times the median income. This is not the case in America.

This adjustment of the financial returns of German professors according to the capability of each individual is due primarily to variations of income within the same institution. Of course, as in the United States, there is a considerable variation among the institutions themselves. Owing to the different fiscal policies of the different governments and the different provisions made by the same government for universities in more important locations, and also on account of the difference in fees due to the size of the student body, there will be found German universities in which the average income of the full professor is from twice to three times the average income in some other university. The wide range of the academic income of professors in the same institution is hardly known in America. In any large German faculty some full professor will generally be found who receives for teaching an income from two to five times as large as some of his colleagues. These larger incomes are due to special allowances from the government, to extra university perquisites, and to fees from the large body of students attracted by a superior reputation. Both the German and the American universities pay for merit. This is understood when a man in either country is

made a full professor. The distinction between the two countries is that the German universities pay an unusual amount for unusual merit. In America, on the contrary, the unusual man fares no better than his colleagues of mediocre ability.

TABLE XI
INCOMES RECEIVED FOR TEACHING BY FULL PROFESSORS IN GERMAN
UNIVERSITIES

Amount of Annual Income	Total Number of Professors Receiving said Income	Percentage of Professors Receiving said Income
\$1,000-1,199	5	.7
1,200-1,399	17	2.5
1,400-1,599	38	5.6
1,600-1,799	64	9.4
1,800-1,999	71	10.4
2,000-2,199	82	12.1
2,200-2,399	51	7.5
2,400-2,599	52	7.6
2,600-2,799	54	7.9
2,800-2,999	53	7.8
3,000-3,199	24	3.5
3,200-3,399	21	3.1
3,400-3,599	17	2.5
3,600-3,799	16	2.4
3,800-3,999	16	2.4
4,000-4,199	11	1.6
4,200-4,399	9	1.3
4,400-4,599	13	1.9
4,600-4,799	9	1.3
4,800-4,999	6	.9
5,000-5,199	5	.5
5,200-5,399	7	1.0
5,400-5,599	2	.3
5,600-5,799	1	.1
5,800-5,999	3	.4
6,000-6,199	6	.9
6,200-6,399	3	.4
6,400-6,599	3	.4
6,600-6,799	..	..
6,800-6,999	2	.3
7,000-7,199	2	.3
7,200-7,399	2	.3
7,400-7,599	1	.1
7,600-7,799	2	.3
7,800-7,999	1	.1
8,000-8,199	1	.1
8,200-8,399	2	.3
8,400-8,599	..	..
8,600-8,799	..	..
8,800-8,999	1	.1
9,000-9,199	..	..
9,200-9,399	2	.3
9,400-9,599	1	.1
9,600-9,799	1	.1
9,800-9,999 *	1	.1

* Three professors received incomes of over \$10,000.

Table XII gives the facts of Table XI, distributing the income among the four faculties of each university.* It is evident at a glance that professors of law receive most, and professors of theology least.† Professors of medicine occupy the second place.

TABLE XII
INCOMES RECEIVED FOR TEACHING BY FULL PROFESSORS IN GERMAN
UNIVERSITIES. (Classified by the Subjects Taught.)

Scale of Income	PERCENTAGES OF PROFESSORS RECEIVING EACH AMOUNT			
	In Faculties of Theology	In Faculties of Law	In Faculties of Medicine	In Faculties of Philosophy
\$1,000-1,199	1.	...	.8	.8
1,200-1,399	6.3	...	.8	2.7
1,400-1,599	9.4	...	1.7	7.3
1,600-1,799	17.7	...	5.8	10.8
1,800-1,999	15.6	2.1	4.2	13.3
2,000-2,199	20.8	6.3	12.5	11.1
2,200-2,399	4.2	6.3	14.2	6.5
2,400-2,599	4.2	4.2	7.5	9.5
2,600-2,799	4.2	9.5	8.3	8.4
2,800-2,999	6.3	12.6	8.3	6.8
3,000-3,199	2.1	3.2	5.8	3.3
3,200-3,399	...	8.4	4.2	2.2
3,400-3,599	4.2	3.2	2.5	1.9
3,600-3,799	1.	4.3	3.3	1.9
3,800-3,999	1.	2.1	2.5	2.7
4,000-4,199	...	5.3	1.7	1.1
4,200-4,399	...	2.1	2.5	1.1
4,400-4,599	...	2.1	2.5	2.2
4,600-4,799	2.1	2.1	3.3	.3
4,800-4,999	...	2.1	...	1.1
5,000-5,199	...	2.1	2.5	...
5,200-5,399	...	3.2	.8	.8
5,400-5,599	...	...	...	.5
5,600-5,799	...	...	...	.3
5,800-5,999	...	3.2	...	...
6,000-6,199	...	2.1	1.7	.5
6,200-6,399	...	...	...	.8
6,400-6,599	...	1.	...	.5
6,600-6,799	...	...	...	...
6,800-6,999	...	2.1	...	...
7,000-7,199	...	2.1	.8	...
7,200-7,399	...	...	...	.3
7,400-7,599	...	1.	...	...
7,600-7,799	...	1.	...	.3
7,800-7,999	...	1.	...	...
Over 8,000	...	5.	2.5	1.2

* Faculties of natural science are counted as faculties of philosophy in this table and throughout this bulletin.

† It must be remembered that at eight German universities there are Roman Catholic faculties of theology, which consist largely, if not exclusively, of celibate ecclesiastics.

The essential facts for each group are:

Professors of Law.—There is a very great variability of incomes. It takes a range of sixteen hundred dollars, from \$2,200 to \$3,800, to include half of them. A fourth of the incomes are below \$2,700; half are above \$3,300; a fourth are above \$4,900. There are as many incomes above \$7,400 as there are below \$2,200. The largest income is six times the smallest and three times the median income. The average income is about \$4,000.

Professors of Medicine.—Half of the incomes are between \$2,000 and \$3,000. Half of them are below \$2,200; somewhat over half are above \$2,600; a fourth are over \$3,400. There are as many incomes above \$4,400 as there are incomes below \$2,000. It is difficult to estimate the typical income. It will be between \$2,000 and \$3,100, and probably between \$2,000 and \$2,600. The highest income is seven times the lowest and about three times the median income. The average of the incomes is \$3,100.

Professors of the Faculty of Philosophy.—Half of the incomes are between \$1,600 and \$2,600; three-fourths are between \$1,400 and \$3,000; but there are as many above \$4,000 as there are below \$1,600. A fourth of the incomes are below \$1,850, half are over \$2,300, and a fourth are over \$2,900. An income of \$1,800–\$2,000 is roughly typical. There are twenty-five per cent. of the incomes above \$5,000 compared with twenty-four per cent. for law professors and nine and a half per cent. for professors of medicine. The average of the incomes is \$2,700.

Professors of Theology.—Half of the incomes are between \$1,600 and \$2,200, one-fourth are below \$1,700, one-half are over \$2,800, one-fourth are over \$2,400, and there are as many above \$2,800 as are below \$1,600. The typical income is one of \$1,800–\$2,000 and divergences from this type are not so extensive as in the cases of law and medicine. The highest income is four times as great as the lowest, and about two and a half times the median income. The average of the incomes is \$2,100, higher than the median income and still higher than the typical income because of the greater variability in the deviation of higher incomes.

Table XIII gives the variability of incomes of full professors within the same institution. Table XIV shows approximately the variation among institutions. The values of free residences were not included in the averages of this table. If they had been, the alterations would have been inconsiderable. Where the "Average Total Income" is marked (a), it indicates that one or more professors have a free residence instead of a residence indemnity.

TABLE XIV—*Continued*VARIATIONS WITH RESPECT TO PROFESSORS' INCOMES FROM TEACHING
FOR EACH FACULTY OF THIRTEEN GERMAN UNIVERSITIES.

FULL PROFESSORS				ASSOCIATE PROFESSORS			
Faculty	Average Total Income	Average Salary plus Residence Indemnity	Average Income from Fees	Faculty	Average Total Income	Average Salary plus Residence Indemnity	Average Income from Fees
MEDICINE							
30.	\$4,750	\$1,714	\$3,066	30.	\$1,653	\$941	\$712
31.	a/3,623	1,880	1,754	32.	1,630	843	787
32.	3,525	1,585	1,940	39.	1,590	746	844
33.	a/3,077	1,611	1,498	34.	1,262	798	464
34.	a/2,916	1,339	1,597	31.	1,092	771	325
35.	2,717	1,482	1,235	37.	1,068	763	305
36.	2,549	1,724	825	40.	1,049	761	288
37.	a/2,388	1,549	908	36.	1,017	974	43
38.	a/2,291	1,279	1,049	33.	1,014	754	260
39.	a/2,211	1,256	955	41.	878	643	235
40.	a/2,024	1,235	922	38.	834	719	115
41.	a/1,964	1,277	710	35.	673	573	100
PHILOSOPHY							
42.	a/\$3,561	\$2,164	\$1,397	42.	\$1,504	\$1,011	\$493
43.	3,546	2,033	1,521	48.	1,445	875	570
44.	a/2,660	1,698	979	49.	a/1,333	806	527
45.	a/2,643	1,685	963	44.	a/1,304	1,030	292
46.	2,616	1,484	1,132	47.	1,304	904	400
47.	a/2,592	1,606	995	51.	1,174	808	366
48.	2,348	1,449	899	45.	1,163	820	343
49.	a/2,229	1,390	849	54.	1,145	927	218
50.	a/2,132	1,454	682	53.	1,139	861	278
51.	2,005	1,508	497	50.	1,129	953	183
52.	1,877	1,363	474	46.	1,116	817	299
53.	a/1,876	1,476	410	43.	982	675	254
54.	a/1,757	1,358	439	52.	978	829	149

The associate (*ausser ordentliche*) professors in German universities are of two kinds, the *etatmässig ausser ordentliche* professors and the *nicht-etatmässig ausser ordentliche* professors. The former is the class meant when associate professors are spoken of without any qualifying expression. The latter class is about one-fourth of the entire number, varying in different universities from ten to eighty per cent. They enjoy the title of associate professor, but the title is not accompanied by an appointment from the government, nor do these associate professors draw the government salary appropriate to their rank. They are either teachers who have practically the financial status of privat-docents but have been given the higher title on account of

less effective in causing variability of income than are the special arrangements made to secure the services of specially desirable men. The differing amounts received from student fees are, however, the most important factor in producing large differences in German professorial incomes.

TABLE XIV
VARIATIONS WITH RESPECT TO PROFESSORS' INCOMES FROM TEACHING
FOR EACH FACULTY OF THIRTEEN GERMAN UNIVERSITIES

FULL PROFESSORS				ASSOCIATE PROFESSORS			
Faculty	Average Total Income	Average Salary plus Residence Indemnity	Average Income from Fees	Faculty	Average Total Income	Average Salary plus Residence Indemnity	Average Income from Fees
THEOLOGY—ROMAN CATHOLIC							
1.	\$2,235	\$1,499	\$736	1.	\$1,232	\$917	\$315
2.	1,868	1,530	338	3.	1,067	807	259
3.	a/1,805	1,417	495	4.	a/1,039	905	172
4.	1,672	1,310	362	2.	978	808	170
5.	1,550	1,533	17	5.	785	654	131
THEOLOGY—PROTESTANT							
6.	\$3,120	\$2,200	\$920	6.	\$1,652	\$1,164	\$488
7.	3,103	2,310	832	16.	1,202	1,012	190
8.	2,830	1,819	1,011	8.	1,200	1,011	188
9.	a/2,369	1,846	537	13.	1,190	1,069	121
10.	1,965	1,505	460	12.	1,151	988	163
11.	1,923	1,585	338	11.	946	746	200
12.	1,869	1,609	260	7.	932	727	205
13.	1,789	1,515	274	14.	917	727	190
14.	1,727	1,308	319	9.	894	761	133
15.	1,613	1,379	234	10.	888	698	190
16.	1,588	1,392	196	15.	664	603	61
LAW							
17.	\$6,745	\$2,628	\$4,117	19.	\$2,875	\$870	\$2,005
18.	6,327	2,189	4,138	18.	2,736	955	1,781
19.	5,064	1,859	3,205	21.	2,156	1,045	1,111
20.	4,010	1,564	2,446	27.	2,133	854	1,279
21.	3,696	1,520	2,176	23.	1,897	698	1,098
22.	3,385	1,842	1,543	26.	1,789	917	873
23.	3,322	1,574	1,748	29.	1,756	917	839
24.	2,978	1,387	1,591	24.	1,689	983	706
25.	2,944	1,407	1,537	25.	1,584	698	886
26.	2,738	1,589	1,149	28.	1,539	679	860
27.	2,656	1,344	1,312	20.	1,473	863	610
28.	2,430	1,321	1,109	22.	1,067	689	378
29.	2,386	1,487	899	17.	1,000	542	458

According to the faculties the remuneration of the associate professor is close to half that of the full professor, except in the faculty of medicine. In that faculty it is about four-ninths of the income of the full professor. For the different faculties the facts are:

Associate Professors of Law.—Nearly half of the incomes are between \$1,400 and \$2,000, one-fourth are below \$1,400, half are above \$1,750, and one-fourth are above \$2,100. The average income is \$1,900.

Associate Professors of Medicine.—One-half of the incomes are between \$600 and \$1,200. One-fourth of these are below \$850, a half are above \$1,100, and a fourth are above \$1,525. The average income is \$1,300.

Associate Professors of the Faculty of Philosophy.—Half of the incomes are between \$900 and \$1,400, a fourth are below \$925, a half are above \$1,200, and a fourth are above \$1,450. The average income is \$1,250, but one of from \$1,000 to \$1,200 is typical.

Associate Professors of Theology.—Half of the incomes are between \$800 and \$1,200. One-fourth of them are below \$875, one-half are above \$1,100, and a fourth are above \$1,325. The average income is \$1,250.

The financial status of the privat-docent has already been explained. In the faculty of philosophy the position has no value except as a means to a professorship. In this faculty the privat-docents number about two-fifths of the two grades of professors. The docent in medicine usually receives a return for his services in the professional recognition which his university connection secures for him; the docent in law may receive a similar professional advantage. In medicine the docents number about four-fifths of the number of the two grades of professors; in theology and law docents are rare, numbering less than one-fifth of the combined number of full and associate professors.

The teachers in the Technische Hochschulen at Charlottenburg, Hannover, Aachen, and Dantzig do work comparable to that of the teachers in the Schools of Applied Science or Engineering in American universities. The incomes, here as elsewhere due to regular salary, salary supplement, residence indemnity, and fees, are as shown in Table XVI. For comparison with university teachers of Theology, Law, Medicine, or the Arts and Sciences, the table of full and associate professorships combined—Table XVIII—should be used.

Over nine-tenths of the incomes from teaching in these four Technische Hochschulen are between \$1,200 and \$3,200, half of them between \$1,600 and \$2,600, a fourth are below \$1,650, half are above \$2,075, and a fourth are above \$2,600. There is no clearly typical income, incomes of \$1,200 to \$2,800 being nearly equally frequent. The average income is approximately \$2,150.

TABLE XVI

RELATIVE FREQUENCIES OF DIFFERENT INCOMES FROM TEACHING RECEIVED BY PROFESSORS IN THE TECHNISCHE HOCHSCHULEN AT CHARLOTTENBURG, HANNOVER, AACHEN, AND DANTZIG

Scale of Incomes	Percentages of Professors	Scale of Incomes	Percentages of Professors
Below \$1,000*	1.3	\$2,400-\$2,599	6.6
\$1,000-1,199	2.0	2,600- 2,799	10.0
1,200-1,399	9.3	2,800- 2,999	7.3
1,400-1,599	10.6	3,000- 3,199	4.0
1,600-1,799	10.0	3,200- 3,399	...
1,800-1,999	12.6	3,400- 3,599	2.0
2,000-2,199	12.6	Above 3,600*	2.6
2,200-2,399	9.3		

The Technische Hochschulen have a peculiar class of university teachers, the remunerated docents, who number nearly half as many as the salaried professors. Their incomes are given in Table XVII. Nine-tenths of them are between \$150 and \$1,100, half of them are between \$200 and \$600, a fourth are below \$250, half are above \$440, and a fourth are above \$630.

TABLE XVII

RELATIVE FREQUENCIES OF DIFFERENT INCOMES FROM TEACHING RECEIVED BY THE REMUNERATED DOCENTS OF THE TECHNISCHE HOCHSCHULEN AT CHARLOTTENBURG, HANNOVER, AACHEN, AND DANTZIG

Scale of Incomes	Percentages of Individuals	Scale of Incomes	Percentages of Individuals
\$100-\$199	21.4	\$700-\$ 799	4.3
200- 299	12.9	800- 899	2.9
300- 399	10.0	900- 999	2.9
400- 499	14.3	1,000-1,099	5.7
500- 599	14.3	Over 1,100†	4.3
600- 699	7.1		

Full professors in the Technische Hochschule of Dresden (Saxony) are paid salaries ranging from \$856 to \$2,613; associate professors, from \$286 to \$856. The professors have one-half of the student fees, in addition to their salaries. In some instances individual professors receive annually from fees as much as \$2,500. As elsewhere, it is not the highest salary that necessarily accompanies the highest total of fees.

* The incomes below \$1,000 and above \$3,600 are stated thus indefinitely in order to make identification of individuals' incomes impossible.

† The detailed amounts are withheld to insure the impossibility of identification.

The professors in the Technische Hochschule of Munich are paid on the same scale as the professors in the universities of Bavaria. In effect, the same is true of the other governments and their Technische Hochschulen, not only with regard to salaries but also in regard to pensions.

In order to have a more convenient summary for reference and a picture of the total financial prospect of a university teacher, in Table XVIII the full and salaried associate professors are combined in one group, and the professors in the Technische Hochschulen are included under the heading "Engineering."

TABLE XVIII
INCOMES RECEIVED FROM TEACHING BY FULL AND ASSOCIATE PROFESSORS
COMBINED IN GERMAN UNIVERSITIES

Scale of Incomes	PERCENTAGES OF PROFESSORS RECEIVING EACH AMOUNT.				
	In Faculty of Theology	In Faculty of Law	In Faculty of Medicine	In Faculty of Philosophy	In Faculty of Engineering
\$ 200 to \$ 799	4	..	9	4	1
800 " 1,399	25	6	22	20	11
1,400 " 1,999	34	12	14	29	33
2,000 " 2,599	22	16	16	20	29
2,600 " 3,199	9	22	16	13	21
3,200 " 3,799	4	14	8	4	2
3,800 " 4,399	1	7	5	3	1
4,400 " 4,999	2	5	4	3	..
5,000 " 5,599	..	4	2	1	1
5,600 " 6,199	..	4	1	1	..
6,200 " 6,799	..	1	..	1	..
6,800 " 7,399	..	3	1	..	..
7,400 " 7,999	..	2	..	..	..
8,000 " 8,599	..	1	1	..	..
Over 8,600	..	3	1	1	..

The incomes given in Tables XI, XII, XV, and XVIII could properly be increased by adding the salaries which some professors receive from sinecure offices in the government, or offices which, while not altogether sinecure, are compensated out of proportion to the services rendered. An appointment to these offices is practically, in whole or in part, like an allowance on the sovereign's civil list. To differentiate such appointments from the government offices in which the salary is the ordinary recompense for services performed is, however, a task too delicate and subjective to be made except by one familiar with the facts of each individual case. Table XIX, therefore, gives the incomes of professors from government offices outside of the university, without regard to the nature of the offices or the amount of labor that they involve. As the data

at hand are from Prussian universities only, the table refers to the Kingdom of Prussia alone.

TABLE XIX
INCOMES OF UNIVERSITY PROFESSORS IN PRUSSIA FROM EXTRA-
UNIVERSITY ROYAL OFFICES

Scale of Extra- University Salaries	PERCENTAGES OF PROFESSORS RECEIVING THE DIFFERENT AMOUNTS							
	FULL PROFESSORS				ASSOCIATE PROFESSORS			
	Theology	Law	Medicine	Philosophy	Theology	Law	Medicine	Philosophy
\$0 to \$99	9.0	..	..	2.0	3.3	..	..	.8
100 " 199	4.0	..	2.0	2.3	..	4.0	1.5	1.7
200 " 299	9.0	4.0	..	8.3	6.7	4.0	..	2.5
300 " 399	5.3	..	1.0	.7	3.3	8.0	1.5	2.5
400 " 499	2.7	..	2.0	1.0	3.3	4.0	3.0	..
500 " 599	..	..	2.0	1.7	..	..	3.0	3.3
600 " 799	1.3	1.0	2.0	.7	3.3	4.0	1.5	.8
800 " 999	1.3	..	..	1.3	..	..	3.0	..
1,000 " 1,199	..	..	2.0	1.0	..	..	..	1.7
1,200 " 1,399	..	..	3.0	1.0	..	..	..	..
1,400 " 1,599	..	..	3.0	.7	..	..	..	.8
1,600 " 1,799	1.3	..	2.0	.3	..	..	1.5	1.7
1,800 " 1,999	..	..	1.0	..	..	..	..	..
2,000 " 2,499	..	..	..	..	..	..	..	..
2,500 " 2,999	..	..	1.0	.3	..	..	1.8	.8
3,000 " 3,499	..	..	..	..	..	..	..	..
Over 3,500	1.3	..	..	..	..	..	..	..

Table XIX, while an interesting addendum to Tables XI, XII, XV, and XVIII, does not alter the value of those tables for purposes of comparison with the remuneration for university teaching outside of Germany. With the exception of the membership in the Royal Academy of Sciences, the total effect of outside offices held by professors in the Prussian government is not different from the effect of similar outside positions obtained through a university connection by university professors in other countries. In Prussia, while these extra-university salaries tend at times, especially in the case of professors of theology, to compensate for a low income, their general influence is to increase incomes that are already high. It should also be remembered that in Germany, as elsewhere, the fiscal authorities can occasionally make a position financially more attractive to an individual in other ways than by direct increase of salary.

The professorial incomes which have been given must, of course, be interpreted in terms of the cost of living. To compare this cost of living with the

similar cost for an American university professor is difficult. The Carnegie Foundation has endeavored to obtain the cost of provisions, servant-wages, and house rent in the German university cities, in order to be able to institute a comparison with a similar investigation conducted in America. The cost of food-stuffs in Germany, especially since the new Imperial Tariff Act, is higher than in the United States; the wages of servants, on the other hand, are very much lower. House rent is lower than in America, although not nearly as much lower as servant hire. For the latter item there is, as in the United States, a great difference between different localities. Marburg and Berlin can no more be considered together in respect to the necessary scale of professorial expenditure than can Charlottesville and New York. Furthermore, in Germany no more than in America, is it possible to estimate what a professor and a professor's family need to spend. Individuals and families vary in their necessities and standards of living as much in university circles as in other circumstances of life. Probably, however, it will be a fair approximation to the facts if we estimate the cost of living in the localities of the United States in which universities most comparable to those of Germany are situated, taking all of these variables into account, as one and a half times greater than in Germany.

Compared with other classes in the community, the German university professor is still better off than his American colleague. He ranks financially with very important legal and administrative officers; and no principal of a normal school or head of a city system of schools approaches in income from educational work the income received by a considerable percentage of university professors. The German governments pay teachers in the elementary schools well, and the teachers in the secondary schools especially well, but the full professor in a university receives over four times as much as the former and over twice as much as the latter class. The financial status of the university professor in Germany is thus seen to be at the top in the educational world and on a level with all except the nobility and the more successful of business men. It is unnecessary to revert to the dissimilar position of the university professor in America. And human nature being what it is, the higher relative prosperity of the German professor probably seems as important to him as his higher absolute prosperity.

TENURE OF OFFICE AND PROVISIONS FOR RETIREMENT

Removal from a professorship except for gross and flagrant violation of its responsibilities is by custom impossible in German universities. The general custom is to permit a professor to continue his work and receive his income therefrom as long as he likes. The number of professors of advanced years who retain their regular positions is very high, as shown in Table XXI. It must be borne in mind that the work actually required of a professor makes very slight demands upon bodily strength. If in old age a professor chooses to give up the work of teaching, the general tendency is to release him from the work but to leave his income unchanged except for the loss of fees. Sometimes an allowance is a little less than this; sometimes it is made even more by a recompense in lieu of fees. If, though not advanced in years, he becomes unable to fulfil the very small requirement of lecturing, financial provision may be made for him by special arrangement or by formal regulations. The conditions in each of the universities are stated in Table XX.

The widow and minor children of the professor are in general provided for by the government or by some government-aided organization. In the eleven universities where the allowance to the professor's family is irrespective of the salary at the time of death, its annual amount is approximately \$400 for the widow of a full professor; \$90 for each child until the age of twenty-one while the mother lives, or \$130 in case of her death. The annual allowance to the family of an associate professor is approximately \$300 for the widow and, except at Leipzig, the same \$90 and \$130 for a child.

In the universities where the allowance is dependent on the salary of the professor there is more variability. The central tendency is to an annual allowance to the widow of one-fourth of the husband's last salary and to each child of one-fifth of the widow's allowance while she lives and three-tenths of it in case of her death. The details for the various German governments follow.

TABLE XX

TABULAR STATEMENT OF RETIRING ALLOWANCE SYSTEMS IN GERMAN UNIVERSITIES

UNIVERSITY	GENERAL ARRANGEMENTS FOR RETIREMENT	INITIATIVE FOR RETIREMENT	REGULATIONS FOR INCOME OF RETIRED PROFESSORS	AMOUNTS OF INCOME ACTUALLY RECEIVED BY RETIRED PROFESSORS
Universities in Kingdom of Prussia. (Berlin, Bonn, Breslau, Göttingen, Greifswald, Halle, Kiel, Königsburg, Marburg, Münster.)	No fixed system of pensions. Release from obligation of lecturing. The professor may lecture if he chooses.	Only on request of the professor which may be granted or refused by fiscal authorities.	Full salary plus residence indemnity plus possible grant in lieu of fees.	Full professors: At Berlin, \$2,881 (average); Elsewhere, \$1,713 (average). Associate professors: At Berlin, \$1,016 (average); Elsewhere, \$657 (average).
Universities in Kingdom of Bavaria. (Erlangen, Munich, and Würzburg.)	The general custom is to release from the obligation of lecturing, leaving the professor his full salary, but there is also a legal provision for formal pensioning.	In general as in Prussia. For disability, at the option of the fiscal authorities. After the age of 70 or after 40 years of service at the option of the professor.	In general as in Prussia. 80% of all salary (but not residence indemnity) if during first 10 years of service, 90% thereafter; 100% if the professor is 70 years or over. Only after forty years of service is the royal government required to give a pension.	Full professors from \$908 to \$1,465 according to length of service in case of disability. Associate professors from \$603 to \$1,327 according to length of service.
Universities in Grand Duchy of Baden. (Freiburg and Heidelberg.)	Legal provision for pensioning.	For disability after ten years of service at the option of the fiscal authorities. After the age of 65 at the option of the professor or of the authorities. The latter option is not exercised.	80% of the last salary (including residence indemnity) plus 1½% for each additional year of service; but not to exceed \$1,763 or 75% of the salary, except by grant of the state.	80% of the last salary plus 3% for each year of service over five through the tenth, plus 1½% for each year from the eleventh through the thirtieth, plus 1% for each year from the thirty-first through the fortieth. Full salary after fifty years of service.
University of Giessen. (Grand Duchy of Hesse.)	Legal provision for pensioning.	For disability after five years of service. The professor may retain his position regardless of age.	40% of last salary plus 3% for each year of service over five through the tenth, plus 1½% for each year from the eleventh through the thirtieth, plus 1% for each year from the thirty-first through the fortieth. Full salary.	Full salary.
University of Jena. (Grand Duchy of Saxe-Weimar.)	No fixed system of pensions. Release from the obligation of lecturing.			

University of Leipzig. (Kingdom of Saxony.)	No fixed system, though the income of a retired professor is called a pension.	Only on request of the professor. The fiscal authorities can only suggest retirement informally.	Individual arrangements are made. Approximately the full salary, but sometimes less and sometimes more.
University of Rostock. (Grand Duchy of Mecklenburg-Schwerin.)	No fixed system of pensions. Release from the obligation of lecturing.		Full salary.
University of Strassburg. (Alsace-Lorraine.)	No fixed system of pensions. Release from the obligation of lecturing.		Full salary.
*University of Tübingen. (Kingdom of Württemberg.)	Legal provision for pensioning.	For disability incurred in the discharge of official duty at any age. For disability after 9 years of service. For old age after 65. Retirement is by the royal government or by its own initiative or that of the professor.	40% of the last salary (including any personal supplement) after 9 years. Plus 1% for each additional year of service. Salary is \$570 or more. If the salary is under \$570, with limits of 85% and 92 1/2% respectively; full professors receive also 1/2 of the salary in lieu of the fees lost.
Technische Hochschulen of Prussia.	Legal provision for pensioning. The law has lately been changed, but the nature of the change has not been made public.		
Technische Hochschule of Saxony.	Legal provision for pensioning.	As for royal officers in general.	30% of the last salary after 10 years of service increasing to 50% after 39 years of service.
Technische Hochschule of Bavaria.	The same provision as for professors in the universities of Bavaria.		

*The Minister of Ecclesiastical Affairs and Public Education of the King of Württemberg hopes for the passage of a law raising the maximum pension from \$1,425 to \$1,900.

PENSIONS OF WIDOWS AND ORPHANS OF UNIVERSITY PROFESSORS

KINGDOM OF PRUSSIA.—Formerly foundations of mutual funds existed in the Prussian universities for the payment of pensions to widows or orphans of deceased professors. Since 1889 the members of the mutual funds have been released from the payment of contributions—except in instances where additional mutuals are maintained—and the royal government allots an annual subvention to the several funds in order to make it possible to pay a fixed pension to widows and orphans. The amount of the royal subvention was \$61,500 in 1907. The pension is at present \$393 annually for the widow of a full professor, and \$309 yearly for the widow of an associate professor, with the following additional provision: If the widow was more than fifteen years younger than the deceased, a twentieth of the pension is deducted for each year of the difference in ages from the fifteenth to the twenty-fifth—that is, from one-twentieth up to one-half—and for every year of the marriage in excess of five years one-twentieth of the total ordinarily due is added until the full amount is again restored. The pension for an orphan who has lost both parents is \$171 annually; for every other orphan \$115; for the eldest orphan whose mother is still living, \$115,—for other children in the same family, each \$71 per annum. The pension of the orphan ceases with the twenty-first completed year or with marriage.

There are also other special funds existing at some Prussian universities, having as their sole object the assistance of widows and orphans of deceased professors. The amounts paid are relatively small.

KINGDOM OF BAVARIA.—The widow of a professor in a Bavarian university receives one-fifth of the last salary of the deceased, in case he had been in active service at the time of his death, or one-fifth of his pension, if the professor had retired on a pension. The widow's pension may be increased by one-half if she suffers certain bodily disability, such as total blindness.

Orphans whose mother is still living receive each one-fifth of the amount of the widow's pension. If a child has lost both parents, it receives three-tenths of what the mother's pension would have been if living. Pension of the orphan continues usually to the age of twenty-one, unless maintenance has previously been provided for a daughter through her marriage. The widow's pension is likewise cancelled if she marries.

The state pension for widows and orphans is much less in Bavaria than in Prussia. However, there is in Bavaria the Universal State Service Maintenance

Association, which the professors join largely. It provides not inconsiderable pensions for widows and orphans. The society has three classes of members—full professors belonging to the first class, and associate professors to the second class. Those in the first class of royal officials pay \$22 (90 M.) annually, and those in the second class \$13 per year as dues, if members. The widow of a man in the first class is paid \$143 (600 M.) yearly, as long as she remains single. Each orphan whose mother is living receives one-fifth, and each full orphan three-tenths of the mother's pension, until twenty-one years of age, or until married; in the second class, the widow receives \$95 (400 M.) yearly, and the orphans the same ratio as before. The royal government pays subventions to this fund. Also, whether he eventually becomes a member or not, each professor must pay ten per cent. of his salary for the first year to this society, and likewise when promoted he pays ten per cent. of the increase. He is allowed six months after securing his appointment to decide whether he will become a member of the society or not, and there is a small fine for those who join late. A "daughter-fund" to extend beyond the time when the daughter arrives at twenty-one is managed by the society. Each member pays \$6.50 yearly to this department. It provides a pension—at present of \$58 (240 M.) a year—to daughters of deceased professors. The pension begins at the age of twenty-one, and is paid so long as the daughter remains unmarried or does not enter a convent.

There is a special "widow-fund" at the Bavarian University of Erlangen, participated in only by full professors. Each one who desires to become a member must pay five per cent. of his first year's salary income and five per cent. of every increase. Every full professor, also, whether a member of the fund-society or not, must pay an annual assessment of \$4.50 to this fund. As the fund now stands, the widow is paid about \$202 per year. If the mother is not living, a similar amount is divided among the children until they are of legal age—that is, until the end of the twenty-first year.

KINGDOM OF SAXONY.—In the University of Leipzig there is a "widow-fund" in connection with the university, having its own endowment. It is also aided by the royal government. The pension for the widow of a full professor is \$428 annually, and for that of an associate professor \$238, or one-fifth of the last salary of the deceased, in case the latter amount is the larger. The pension for full orphans is three-tenths and for "half-orphans" one-fifth, for each, of the pension to be reckoned for the widow. There is also a fund in the University of Leipzig, maintained by mutual payments, that yields a pension of \$71 annually to the widow of a full professor, and \$48 yearly to that of an associate professor.

GRAND DUCHY OF BADEN.—In the universities of Baden a special fund is maintained under grand-ducal supervision and with a yearly grand-ducal subvention of above \$154,000, for the purpose of providing pensions for the widows and orphans of all grand-ducal officials. Each professor pays three per cent.

of his salary into this fund. The widow receives thirty per cent. of the last salary of the deceased, and each "half-orphan" has a pension income of two-tenths of the widow's pension. Each full orphan receives four-tenths of the widow's pension; but two receive together seven-tenths, and if there are three or more full orphans they receive each three-tenths of the widow's pension.

KINGDOM OF WÜRTTEMBERG.—The fund maintained by the royal government yields a pension to the widow of a professor at the University of Tübingen of one-third of the salary of the professor at the time of his death, or one-third of the amount of the pension he would have been entitled to if he had been pensioned. The "half-orphan" has one-fifth, and the full orphan one-fourth of the pension of the widow, or that which she would have received had she been living. Steps were taken during the summer of 1907 to raise the pension of the widow to fifty per cent. instead of thirty-three and one-third per cent. Only in exceptional instances is the pension paid to orphans over eighteen years of age.

GRAND DUCHY OF HESSE.—The pension which a widow of a professor at the University of Giessen receives from the grand-ducal government is regularly thirty per cent. of the pension received by the deceased, provided he was pensioned at the time of his death—or of the pension possible to him at that time. However, the widow's pension must not fall below \$52, and in the case of salaries under \$594 must amount to at least one-fifth of the salary, and in the event that the salary was above \$594 the pension must amount to at least \$119.

The pension of the orphan or orphans is as follows:

1. In the case of children whose mother still lives, one-fifth of the amount received by the widow;
2. In the case of full orphans—for the eldest child, two-thirds of the pension the mother would have received had she been living; if there are two orphans living, each receives one-half of the widow's pension; if three, each receives one-third of the same.

However, the pension of the widow and of the orphans, taken together or separately, must not exceed the amount of the pension which the professor would have drawn had he been living. Moreover, the pension of the orphan ceases with arrival at the age of eighteen.

GRAND DUCHY OF MECKLENBURG-SCHWERIN.—The widow of a professor at the University of Rostock receives one-fourth of the salary of her husband. The highest pension possible for the widow of a full professor is therefore \$392, and of an associate professor \$214. The children whose mother still lives receive one-fifth of the pension of the widow, whereas full orphans receive two-fifths of this amount each, but all of the orphans together may not receive more than the total pension of the mother, or that which she would have received had she been alive.

ALSACE-LORRAINE.—The widow of a professor at the University of Strass-

burg receives from the treasury of the Reichsland one-fifth of the amount last drawn as salary by the deceased—with exception of the salary supplements. However, this sum may not be less than \$228 or more than \$381 in amount. Each orphan receives \$75 annually from the same source.

GRAND DUCHY OF SAXE-WEIMAR.—There is a special Academic Widows' and Orphans' Benevolent Association at the University of Jena, to which all professors and other university officers belong. The annual assessment for either full or associate professors is \$26, deducted from the salary in four quarterly installments. The widow's pension is \$214; that of the minor orphans whose mother is living is \$48 for the eldest, \$36 annually for the second in age, and \$24 yearly for each other child in the family. The total pension of widow and orphans may not exceed \$345. The pension for full orphans is: \$143 annually for the eldest, for the second in age \$36, and for each of the others \$24. The total pension of the full orphans may not exceed \$240. The children separated from the mother through divorce proceedings are treated as full orphans. Likewise, if the mother remarries, the children are considered as full orphans. Orphans may take a new age classification after the death of a brother or sister.

The relatives of a deceased professor of the University of Jena are also entitled to a burial-fund, equivalent to the yearly assessment of the society.

TECHNISCHE HOCHSCHULEN

In the Technische Hochschulen of Prussia, a widow's pension is forty per cent. of what her husband's pension would have been in the event that he had been pensioned on the day of his death. The pension of a widow must be at least \$56, and in the case of a widow of an official of the fourth class—to which the *etatsmässig* professors belong—may not exceed \$475.

Each orphan whose mother is still living receives a sum equal to one-fifth of the amount allotted to the mother, and each full orphan receives one-third of the amount which the mother would have been paid had she been living. The pension of widow or of orphans, taken together or separately, may not exceed the amount of the pension to which the deceased was entitled, or would have been entitled to if pensioned on the day of his death.

TABLE XXI
DATA CONCERNING AGES OF FULL PROFESSORS IN GERMAN UNIVERSITIES.

UNIVERSITY	Total Number of Full Professors	FULL PROFESSORS STILL IN SERVICE AT THE AGE OF SIXTY-FIVE OR OLDER.				
		Age 65-69	Age 70-74	Age 75-79	Age 80 or more	Total Number 65 or above 65
PRUSSIA:						
Berlin.....	88	9	8	6	2(80)	25
Bonn.....	65	7	1	2	1(82)	11
Breslau.....	65	8	2	1	..	11
Göttingen.....	65	6	7	1	..	14
Greifswald.....	45	3	1	1	..	5
Halle.....	54	6	4	..	..	10
Kiel.....	44	5	2	1	..	8
Königsberg.....	50	4	2	..	..	6
Marburg.....	49	3	2	..	1(84)	6
Münster.....	39	..	1	1	1(82)	3
BAVARIA:						
Munich.....	77	5	4	2	*1(85)	12
Würzburg.....	43	5	..	..	..	5
Erlangen.....	42	1	2	..	..	3
SAXONY:						
Leipzig.....	68	7	5	2	1(82)	15
WÜRTTEMBERG:						
Tübingen.....	53	6	3	..	..	9
BADEN:						
Freiburg.....	48	2	5	..	..	7
Heidelberg.....	47	3	4	..	1(80)	8
ALSACE-LORRAINE:						
Strassburg.....	52	5	3	..	..	8
HESSE:						
Giessen.....	47	1	2	..	..	3
SAXE-WEIMAR:						
Jena.....	37	5	1	1	..	7
MECKLENBURG-SCHWERIN:						
Rostock.....	35	1	2	..	..	3
Totals.....	1,113	92	61	18	8	179

* Since deceased.

TABLE XXII
DATA CONCERNING AGES OF ASSOCIATE PROFESSORS IN GERMAN
UNIVERSITIES

UNIVERSITY	Total Number of Associate and Honorary Professors	ASSOCIATE PROFESSORS STILL IN SERVICE AT THE AGE OF SIXTY-FIVE OR OLDER				
		Age 65-69	Age 70-74	Age 75-80	Age 80 or more	Total Number 65 or above 65
PRUSSIA:						
Berlin.....	125	10	9	2	1(83)	22
Bonn.....	29	..	1	..	..	1
Breslau.....	27	2	..	1	..	3
Göttingen.....	29	5	..	1	1(83)	7
Greifswald.....	18	..	1	..	..	1
Halle.....	38	3	2	1	1(81)	7
Kiel.....	24	..	..	..	..	..
Königsberg.....	25	1	..	3	..	4
Marburg.....	23	1	..	..	..	1
Münster.....	14	..	..	..	..	..
BAVARIA:						
Munich.....	61	1	1	1	..	3
Würzburg.....	22	1	..	..	..	1
Erlangen.....	11	1	..	..	..	1
SAXONY:						
Leipzig.....	83	..	1	1	..	2
WÜRTTEMBERG:						
Tübingen.....	25	1	..	..	..	1
BADEN:						
Freiburg.....	43	2	1	..	1(80)	4
Heidelberg.....	71	5	1	3	..	9
ALSACE-LORRAINE:						
Strassburg.....	22	2	..	..	..	2
HESSE:						
Giessen.....	8	..	..	..	..	0
SAXE-WEIMAR:						
Jena.....	55	3	..	1	..	4
MECKLENBURG-SCHWERIN:						
Rostock.....	12	..	1	..	..	1
Totals.....	765	38	18	14	4	74

TABLE XXIII

AVERAGE AGE OF FULL PROFESSORS IN PRUSSIAN UNIVERSITIES. (1907.)

UNIVERSITY	Number of Full Professors	AVERAGE AGE IN GIVEN FACULTY				
		In Faculty of Theology	In Faculty of Law	In Faculty of Medicine	In Faculty of Philosophy	Average of Faculties
Berlin.....	88	61.5	60.5	61.5	58.5	59.6
Bonn.....	65	54.5	53.1	59.4	54.0	54.8
Breslau.....	65	54.0	53.4	54.3	51.3	52.5
Göttingen.....	65	56.0	57.9	53.0	56.5	56.1
Greifswald.....	45	48.2	48.0	50.2	52.5	51.0
Halle.....	54	59.6	50.8	59.3	54.5	55.8
Kiel.....	44	55.0	57.2	57.4	51.2	53.7
Königsberg.....	50	56.0	41.8	53.5	51.0	51.1
Marburg.....	49	54.0	47.6	52.3	55.4	53.3
Münster.....	39	52.0	42.2	....	52.3	50.2
Average	Total 564	55.1	52.1	56.0	54.3	54.4

TABLE XXIV

AVERAGE AGE OF FULL PROFESSORS IN GERMAN UNIVERSITIES, EXCLUSIVE OF PRUSSIA. (1907.)

UNIVERSITY	Number of Full Professors	AVERAGE AGE IN GIVEN FACULTY						Average of Faculties
		Theology	Law	Medicine	Philosophy	Political Science	Natural Science	
BAVARIA:								
Munich.....	77	50.3	61.1	57.6	54.5	55.1	....	55.5
Würzburg.....	43	46.1	49.7	48.7	49.4	....	....	48.9
Erlangen.....	42	53.7	46.2	50.8	52.1	....	....	51.3
SAXONY:								
Leipzig.....	68	61.2	59.5	62.3	55.3	....	....	57.6
WÜRTTEMBERG:								
Tübingen.....	53	56.2	47.0	51.9	48.7	52.7	55.0	51.8
BADEN								
Freiburg.....	48	55.0	49.7	54.8	53.0	....	....	52.9
Heidelberg.....	47	53.0	58.3	52.9	50.8	....	61.3	54.2
ALSACE-LORRAINE:								
Strassburg.....	52	47.2	54.5	57.2	54.7	....	....	53.3
HESSE:								
Giessen.....	47	48.8	42.6	47.0	51.0	....	....	48.9
SAXE-WEIMAR:								
Jena.....	37	55.5	55.4	53.8	55.1	....	....	54.9
MECKLENBURG - SCHWERIN:								
Rostock.....	35	61.8	49.5	52.5	48.0	....	....	51.7

TABLE XXV
AVERAGE AGE OF ASSOCIATE PROFESSORS AND HONORARY FULL PROFESSORS IN THE FACULTIES OF THE PRUSSIAN UNIVERSITIES. (1907.)

UNIVERSITY	Number of Professors Included	AVERAGE AGE IN GIVEN FACULTY				
		In Faculty of Theology	In Faculty of Law	In Faculty of Medicine	In Faculty of Philosophy	Average of Faculties
Berlin.....	125	57.0	54.0	56.0	53.0	54.6
Bonn.....	29	42.8	....	55.9	45.0	48.0
Breslau.....	27	43.6	54.7	52.3	46.5	48.5
Göttingen.....	29	40.8	64.0	54.8	52.2	52.3
Greifswald.....	18	*33.0	56.0	50.3	43.5	44.8
Halle.....	38	51.0	51.0	52.0	52.0	51.7
Kiel.....	24	44.0	40.5	46.6	48.5	46.6
Königsberg.....	25	41.5	51.0	52.0	51.5	50.8
Marburg.....	23	43.3	42.0	43.2	46.0	45.1
Münster.....	14	60.0	41.6	....	43.0	45.0
Average.....	Total 352	47.3	51.7	53.6	50.2	50.8

* One case only.

TABLE XXVI

AVERAGE AGE OF ASSOCIATE PROFESSORS AND HONORARY FULL PROFESSORS IN THE FACULTIES OF GERMAN UNIVERSITIES, EXCLUSIVE OF PRUSSIA. (1907.)

UNIVERSITY	Number of Associate and Full Honorary Professors	AVERAGE AGE IN GIVEN FACULTY						
		Theology	Law	Medicine	Philosophy	Political Science	Natural Science	Average for University
BAVARIA:								
Munich.....	61	....	50.4	48.3	44.0	57.0	....	46.5
Würzburg.....	22	34.0	....	51.8	45.3	....	....	48.5
Erlangen.....	11	....	....	41.8	46.0	....	....	44.0
Average for Bavaria.....		34.0	50.4	46.3	44.5	57.0	....	47.1
SAXONY:								
Leipzig.....	83	54.8	49.7	48.0	47.0	....	....	47.8
WÜRTTEMBERG:								
Tübingen.....	25	33.0	34.0	50.8	44.2	....	42.1	43.1
BADEN:								
Freiburg.....	43	42.7	32.5	45.3	47.3	....	....	45.3
Heidelberg.....	71	54.0	51.8	44.1	53.0	....	46.8	48.3
ALSACE-LORRAINE:								
Strassburg.....	22	39.6	52.0	49.5	57.5			49.6
HESSE:								
Giessen.....	8		45.0	39.0	43.8			42.8
SAXE-WEIMAR:								
Jena.....	55	32.5	43.0	42.0	46.3			40.9
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**THE ~~C~~ARNEGIE FOUNDATION
FOR THE ADVANCEMENT OF TEACHING**

**STANDARD FORMS FOR FINANCIAL REPORTS
OF COLLEGES, UNIVERSITIES, AND
TECHNICAL SCHOOLS**

BULLETIN NUMBER THREE

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INTRODUCTION

THE present bulletin is the result of a prolonged inquiry concerning the practice of universities and colleges in the United States in the rendering of public financial statements of their receipts and of their expenditures. It represents also the results of many conferences with the financial officers of colleges and universities, as well as with public accountants and others familiar with the object which such financial statements should serve.

Tax-supported institutions are required by law to print an annual detailed statement of their receipts and expenditures. These reports in some cases simply give the list of separate vouchers. While this may have a value in complying with the state law, such reports serve only a limited purpose in showing the actual operations of the institutions concerned. Nevertheless, it is true that the tax-supported institutions have had a real source of strength by reason of this enforced publicity.

Among endowed institutions only a small minority publish annual financial statements. The great mass of institutions of higher learning in the United States bearing the name college or university make no public accounting of the disposition of the moneys which they receive.

It seems clear that both from the standpoint of its own efficiency no less than from the standpoint of its obligation to the public, every public institution like a college should print annually a report as to the use of the moneys which it has received. It is in the hope of facilitating this public duty, and with the hope further of bringing about some uniformity in these reports, that the present study was undertaken. In its prosecution the effort has continually been made to avoid the complexities of too great detail and to reduce the information which ought to be given to the simplest and most intelligible form.

In order to do this it is necessary to know with some definiteness two things: (1) Who are the persons who make use of financial reports from colleges; and (2) What do those who examine such reports wish to ascertain from them?

From the somewhat extended inquiry which has been made it may be stated with definiteness that the reports of the financial officers of colleges are read by very few people, and these may be classified in the following three groups:

1. Trustees, alumni, and friends of the institution who are directly interested in its welfare;
2. Men of means who contemplate gifts to colleges or who have made such gifts;
3. Individuals and agencies like the United States Bureau of Education engaged in a study of educational methods and cost.

It seems also clear from the inquiries which I have been able to make that these three groups seek to ascertain essentially the same fundamental facts concerning the financial conduct of colleges and universities, with the addition that students of edu-

cation are interested not only in the statistics of a single institution, but in comparative statistics as well.

It may be assumed also that each of these groups of readers of financial reports desires in the first place the presentation of the financial status and conduct of an institution in gross. They all ask three fundamental questions:

1. What is the total income of the institution for the year?
2. What is its annual expenditure?
3. What are the assets at the end of the year?

A considerable number of those who examine reports are satisfied when these leading facts are known, and all subsequent information which can be given consists really of details concerning these three exhibits. The practical questions which have to be met are: What are the significant details to show? and, To what extent must the analysis of assets, liabilities, income, and expenditure be carried in order to show the significant needs or to test the quality of the expenditure?

The answers to these questions depend not so much on expert accounting skill as upon sound business judgment, combined with some educational appreciation of the relation of the cost of education to its efficiency.

In the schedules presented herewith Schedule A shows the gross summaries which indicate the condition of the institution at the end of its fiscal year and its income and expenditures during the year. These give the concise view of the financial status of the institution which the reader first desires to know. The schedules which then follow are intended to offer, in such detail as may be sufficient and not burdensome, the significant items of assets, liabilities, receipts, and expenditures.

While details are included which will be needed only in the case of a large institution with many departments, the report is also arranged for the use of any college, however simple its organization. To provide the material for such an exhibit as is here suggested it is only necessary that the ordinary details of bookkeeping shall be undertaken in some systematic form.

I venture to urge again the duty of every college, whether supported by taxation or by endowment and tuition fees, to make annually a report to the public of its financial operations. The state institutions, as I have stated, are required by law to do this; the absence of such a practice has been a source of much of the looseness which has characterized the financial conduct of many colleges. The college has everything to gain by opening its books to the public, and those who give to colleges will more and more generally insist upon having a definite statement of the use which the college has made of its money. No college which refuses to do this deserves to be entrusted with money. There can be no question, also, but that colleges and universities will be less worldly and less commercial in their standards in proportion as they accept clearly their financial limitations. In the light of complete publicity

sound financial standards as well as sound educational ones will tend to drive out poor standards.

Second, I wish to urge that, whether a college follows the exact schedules suggested here or not, those who make its financial reports should seek to segregate those items of income and expense which reveal the significant lines of expenditure, such, for example, as salaries of teachers, the cost of administration, the upkeep of the physical plant, the expenses of different departments, and the like.

Every effort has been made to simplify as far as possible the schedules which follow, and it is necessarily assumed that they will be adjusted by each institution to meet its own needs. As before stated, these schedules are designed primarily as a form for an acceptable annual exhibit of the financial operations of an educational institution. On the other hand, they are suggestive of a method of bookkeeping. But it must be remembered that the actual keeping of the accounts from day to day, especially the designing of a cash-book best suited to the needs of an institution and best adapted to a minimum expenditure of energy, has in recent years become a profession. In whatever method the books are kept the data here called for should be easily obtainable from them.

A word may be said concerning the best date for the beginning of the fiscal year. At present there is no uniformity in practice among institutions of learning in this matter. The majority of institutions which issue financial statements begin the year as of date July 1, and this is apparently the most convenient date. It is, therefore, suggested that colleges and universities adopt July 1 as the beginning of the fiscal year in the interest of uniformity and comparability. It seems to be the only date upon which agreement could be had, and it has the additional advantage of coinciding with the fiscal year of the general government, of many states, and of many business enterprises.

While the schedules which follow are in most cases self-explanatory, the following statements are made in the interest of greater clearness.

SCHEDULE A

No comment is necessary regarding this schedule. It gives in most condensed form a view of the income and expenditure and the assets and liabilities of the institution.

SCHEDULE B-1

This schedule shows under a group of distinguishing headings the income for the year.

SCHEDULE B-2

This schedule shows an analysis of the first item of the preceding schedule. Such an exhibit is of value both from the educational and the financial standpoint. Colleges have been in the habit of receiving many students at reduced tuition, in many cases giving to a considerable group free tuition. The burden which this entails is

INTRODUCTION

not generally understood. Whether it be a wise practice or not those interested in the college ought to know what this practice actually costs. The acceptance of a scholarship fund generally means an assumption by the college of an additional load. Such a fund is not an endowment of the college, but a subsidy to students dispensed by the college. The fact ought to be made clear in a financial statement both for the benefit of the college and of those who mean to give.

SCHEDULE C-1

This schedule shows under appropriate heads the large items of expenditure, such as the costs of teachers' salaries, administration, laboratory maintenance, upkeep of the physical plant. The effort has been made to introduce only significant groupings. While the form covers the operations of a large university its applicability to those of a small college is evident.

SCHEDULE C-2

The preceding table shows the large items of expenditure. The details of these expenditures can be carried out to any length. The object sought is to go only so far as will serve the needs of those who use such reports. Any trustee of a university who is sufficiently interested to study such a report will desire to know not only the distribution of the income as between the college, the law school, and the medical school, for example, but he will also wish to know how much the college spends upon the teaching of history, how much upon mathematics, and upon other departments. When the institution is a college, this information is likewise desired. Schedule C-2 shows the departmental expenditures in such detail as seems desirable.

SCHEDULE D: BALANCE SHEET

The balance sheet should, of course, contain all of the assets and all of the liabilities of the institution at the close of business on the last day of its financial year, say June 30. Each class of assets and of liabilities should be grouped under distinguishing headings, as shown in the form, without too much detail, so that the balance sheet will show at a glance the financial condition of the institution. Full details making up the totals of the various items shown on the balance sheet should be given on separate schedules, forms for which are presented and explained on the following pages.

The balance sheet is divided into three parts, as follows:

1. Current assets contrasted with current liabilities and balanced by an account which may be either a surplus (of assets) or a deficiency.
2. Investments contrasted with endowments and other permanent funds, exhibiting a surplus (of investments) or a deficiency.
3. Educational plant assets, land, buildings and equipment, contrasted with endowments and other funds, or capital accounts, which have been expended upon the plant.

Every educational institution should exhibit accurately the first part of this balance sheet, i. e., current assets and current liabilities with the resulting surplus or deficit.

Every endowed institution should also exhibit the second part: investments and endowments. The third part, while important, is by no means as important as the other two. It will add much toward a comprehensive view of the institution as a whole whenever part three is exhibited in full, but there are many institutions whose records in respect to costs of plant and equipment are far from complete. It may be that in the majority of the older colleges and schools no reasonably accurate statement of the values of plant and equipment could be given in the balance sheet unless a new and complete appraisal is made of all such property. Such an appraisal is a tedious and costly piece of work, which should not be undertaken unadvisedly. Such appraisals, however, will be found unavoidable, sooner or later, in all university and college accounting, just as such appraisals have been found essential for the public interest for a clear understanding of conditions in railways and other public service corporations throughout the country.

As the schedules which exhibit the funds of the institutions and the related income are referred to in several places on the balance sheet and on the income account, a brief general explanation seems in order at this point. College accounting for endowments and other funds of the institution must consider both principal and income of each fund.

Gain or Loss on Investments

Against the principal of a particular fund a college may hold specific securities or an undivided portion of its general investments. These investments change from time to time. Securities and real estate may be sold, resulting in either a gain or loss to the institution. Such gains or losses fall naturally into two classes, first, those incurred from the sales of specific investments and, second, those incurred from the sales of general investments. If the security sold belongs to a particular fund the gain or loss from such a sale can readily be credited or charged to the principal of this fund.

If, on the other hand, the security sold is a part of the general investment covering numerous funds, it is obviously difficult to distribute any gains or losses arising from a sale over all the funds. It is a great deal easier and quite as equitable to put all such entries into a general account called Gains and Losses on General Investments. If this account shows a credit balance it indicates a net gain in handling investments, and is an accumulation of capital for the institution to account for. A debit balance, on the other hand, indicates a loss in handling investments which should be made up if possible and, in any event, should not be hidden. This item has therefore been inserted in the balance sheet, but on the credit side only, as it is to be hoped that no institution will have occasion to show an accumulating loss of this character.

INTRODUCTION

Surplus Income

The income of a fund is directly related to the investments of its principal. If a fund has its own special investments, its income is solely derived from these investments. If, on the other hand, the fund is invested with others, its income is its *pro rata* share of the income from these general investments.

In either case, if the current income is not entirely expended from year to year the unexpended balance will remain for future use, unless, by some provision of the gift which created the fund, such balances are required to be added to its principal. The income of different funds (and the unexpended balances of this income) may be restricted in use to designated purposes, or may be available for the general purposes of the institution. When there are such balances of unexpended income the accumulation should appear in two items on the balance sheet, and the details should be set up in two classes, as outlined in schedule S.

With this introduction, we may proceed to consider the remaining schedules referred to on the balance sheet.

SCHEDULE E: CASH RECEIPTS AND DISBURSEMENTS AND CASH BALANCES

This schedule exhibits the gross cash receipts of the year contrasted with the gross cash disbursements, together with the cash balances at the beginning and at the end of the year. The schedule also calls for details of cash on hand, such as cash held by the treasurer, the librarian, etc., to meet current expenses. Each official and the amount held by him should be shown separately.

Present business custom requires that all moneys received be deposited in the bank and that all payments be made by check. For sundry small expenditures a fund consisting of a round sum—say \$500 or \$1000, according to the size of the business conducted—should be held on hand, out of which payments in cash are made. At the end of each week or month a detailed voucher for these expenditures should be made out and a check drawn for the total thereof to replenish the fund. This method is in use in business so generally that this suggestion may seem unnecessary, although few colleges follow the practice. If pay-roll or salary accounts are paid in currency, one check may be drawn for the exact amount of the pay-roll and charged to a pay-roll account, which should be distributed subsequently by journal entry.

SCHEDULE F-1: NOTES RECEIVABLE

This schedule is designed to show all of the notes receivable due to the institution, such as notes received for money loaned on collateral securities, notes received from students, etc. A description of each note—the name of the maker, the date of the note, and the date when the note falls due—should be given, and also, where collateral securities are held therefor, a statement of such securities should be given.

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SCHEDULE F-2: ACCOUNTS RECEIVABLE

This schedule merely calls for a list of all accounts receivable by the institution at the end of the financial year and requires no further comment.

SCHEDULE F-3: RENTS RECEIVABLE

This schedule is designed to show the income from the rented property during the year, the collections as made, and finally the balance uncollected to correspond with the amount stated among the current assets on the balance sheet.

SCHEDULE F-4: INCOME FROM RENTS

This schedule is intended to show the profit or loss to the institution from the operation of its rented property during the year. Income from general investments is shown separately from income from special investments.

SCHEDULE G-1

INTEREST AND DIVIDENDS ACCRUED ON SECURITIES. GENERAL INVESTMENTS

SCHEDULE G-2

INTEREST AND DIVIDENDS ACCRUED ON SECURITIES. SPECIAL INVESTMENTS

These schedules exhibit the interest earned in comparison with the interest actually received, and the increase or decrease of interest accrued at the end of the year.

SCHEDULE H: SECURITIES, BONDS, STOCKS, ETC.

This schedule gives a list of the securities held by the institution and shows the transactions in these securities during the year. Some institutions maintain the practice of furnishing the approximate market value of such securities; others do not.

SCHEDULE I: INVESTMENTS IN REAL ESTATE

OTHER THAN UNIVERSITY OR COLLEGE GROUNDS AND BUILDINGS

Many institutions, in addition to their investments in bonds and stocks, invest to some extent in real estate and manage such property themselves, collecting all rents and paying all taxes and other expenditures in connection with the maintenance of the properties.

Schedule I is designed to show all of such properties owned by the institution at the beginning of each financial year, the properties purchased and the properties sold during the financial year, and the properties owned at the end of the year.

In the first column should be entered the figures from the previous year's accounts. The figures to be inserted in the second column are intended to cover any additions and betterments effected during the year, such as additions to buildings and land, or equipment purchased.

SCHEDULES J, K, AND L: EDUCATIONAL PLANT, LANDS, BUILDINGS, AND EQUIPMENT

All of the land, buildings, and equipment necessary for the carrying on of educational work in connection with the institution should be shown in these schedules, which should be considered together.

Schedule J is a summary of the institution's plant, showing the book values at the end of the year. Against these assets, the accounts should provide a reserve for depreciation sufficient to cover the wear and tear not made good by ordinary repairs.

The buildings and equipment deteriorate with age, however, like other structures, and there comes a time when current repairs no longer suffice and when rebuilding becomes necessary. Some of the departmental equipment must be discarded to be replaced by more up-to-date apparatus. Good accounting should distribute these losses over a series of years, by making entries for depreciation and gradually writing down the value of the assets.

This depreciation may be provided, as in the case of the investment real estate, for individual buildings, or departmental equipment (as, for example, the fixtures of a laboratory), or one or more general reserves may be built up by the depreciation charged from year to year.

Real estate used for educational work is not a business asset in the same sense as real estate held as an investment. For this reason the value of the educational plant with the additions and depreciations during the year are made a separable part of the Balance Sheet, Schedule D. It is unquestionably to be desired, however, that an effort be made to place true values on all tangible assets. In this way only can comparisons among similar institutions be made in the matter of costs; and, further, only by this means may a college fairly consider the value of its location with respect to other possible sites. In years past the value of accounting was largely an historical one, and the question as to whether the lands were overvalued or undervalued was not significant. But now that these valuations in accounting are to assist in securing costs and in governing the financial policy, it is quite necessary to fix values for real assets as accurately as possible, and within broad limits to change the valuations as conditions change. To this end the following suggestions are offered:

1. It is not a requisite of good accounting to change the figures of a piece of property every time the market seems to change, but it is important that these changes be made periodically, preferably at stated intervals of from one year to three or five years. Unless an effort is made to do this at given periods, revaluations are apt to occur only when imperative. So important a feature of the accounts should not be left to chance.

2. In the matter of lands, college property seems to be divided into three classes:

- (1) Land, the value of which can be definitely determined from the values of surrounding property, irrespective of the existence of the college. Thus, the value of the site of Columbia University may be estimated by the prevailing

realty values of New York City property in its immediate vicinity. The influence of the college upon the value of the surrounding land is slight.

(2) Land, the value of which is dependent both upon city realty value irrespective of the existence of the college, and upon the influence which the college itself exerts upon the immediate land values. Thus, the land occupied by Harvard University is desirable property as a residential district of easy access to Boston. But the existence of Harvard in Cambridge also undoubtedly holds Cambridge real estate at a higher cost than if Harvard were not there.

(3) Land, the value of which is dependent chiefly upon the existence of the college itself. Princeton University and Hampden-Sidney are types of this class. If either of these institutions were removed their sites would be valuable only as village property or as farm land.

These variables cannot, of course, be sharply differentiated. They may prove helpful in determining a book value which should replace in accounting the original values fixed in some instances many years ago, or the nominal values as given frequently in other instances. It goes without saying that if property is purchased in the open market, the purchase price should be considered the inventory value until changed conditions necessitate a revaluation.

It is generally true that the assessors of a city or county carry in their books the assessed valuation of college real estate even when such property is by law free of taxation. It does not seem to me possible that any failure to furnish a valuation on college real estate used for educational purposes can permanently affect the question of their taxation.

SCHEDULE M: NOTES PAYABLE

Similar details should be given of notes payable by the institution as have been called for in regard to notes receivable, *i.e.*, the name of the lender, the date of the note, and the date of maturity, the rate of interest, and a description of the collateral security given, if any. Interest accrued on each note at the end of the institution's fiscal year should be calculated and entered in the outer column, the total of which column is to be added to the total principal and the gross total of notes payable and interest accrued thereon shown on the balance sheet.

SCHEDULE N: ACCOUNTS PAYABLE

No further details of the accounts payable are required than a list of the names and amounts. If a large number of the accounts are of small amount, to save space these can be entered in one sum as "miscellaneous accounts."

SCHEDULE O: CAPITAL LIABILITIES

This schedule calls for details of the bonds and mortgages on the properties of the institution, such as the dates of issue and the dates when due, the rate of interest and the dates when interest is payable, and a short description of the properties mortgaged.

SCHEDULE P: ENDOWMENT FUNDS, OR TRUST FUNDS, FOR GENERAL PURPOSES

Universities and colleges receive endowments with varied instructions as to how the money may be expended. Some endowments are received with no restriction upon the way in which the money may be used, in others the principal is to be kept intact, but with no restriction as to the purpose for which the income may be expended. In some cases the amount given is to be expended for some designated purpose, in others the principal is to be kept intact while the income is to be expended for some designated purpose.

Schedules P and Q have been designed to show particulars of the endowment funds in two classes—general purposes and designated purposes. Schedule P calls for details of endowment funds of the former class—general purposes. A short description of the fund should be made, giving the name of the fund, the date it was received, the name of the donor, and the purpose for which it was given. This recognition of a gift in the annual financial report is more important than it is generally understood to be. The notes made on the schedule under this heading, which were copied from certain college and university reports, will give a clear idea of the information required. The first three columns should contain the amounts of the funds originally received. The amounts of any funds received during the year should be entered in the second of these three columns. Columns are then given to show what portion of the principal of each fund has been expended, and a short description should be given of what purpose it was expended for—such as additions to buildings or equipment, salaries to professors, etc. At the foot of these columns the portion of the fund expended is divided into assets and expenses. The portion expended on additions to buildings, purchases of equipment, or for such purposes as are additions to the assets shown in the balance sheet, should be shown in total separately from the portion expended for the current expenses of the institution, such as teaching, etc. The column “unexpended principal at end of year” should show the amount of the fund still in the hands of the trustees of the institution, which is presumably invested by them. The last columns should show the income received during the year from these investments in which the unexpended portions of the funds are placed.

SCHEDULE Q: ENDOWMENT FUNDS FOR DESIGNATED PURPOSES

This schedule calls for the same details as in schedule P.

Regarding the investment of the unexpended principal of funds shown in schedules P and Q, the treasurers' reports of some colleges and universities give exact details of the securities in which each fund is invested, while the treasurers' reports of others give only the details of the securities in which each of a few of the larger funds is invested and consolidate the smaller funds, giving details of the securities in which the total is invested. Others again consolidate all of their funds and show the details of securities in which the total is invested.

On both schedules P and Q the columns showing the present unexpended principal of the fund and the current income are divided, to distinguish whether the fund has specific investments of its own, or is merged in a group of general investments. The principal of a special investment may be entirely different in character from the general investments of the institution, and for this reason the amount and rate of income on funds specifically invested may be entirely different from the income on funds in the general investments.

The accompanying schedules are prepared to secure uniformity of financial reports of institutions of learning with little change in the bookkeeping of such institutions, and in the preparation of the schedules it has been assumed that the unexpended portion of endowment funds is invested in such securities as are called for on schedule H, or in real estate, particulars of which are called for in schedule I and that small balances not invested in securities are on deposit in bank accounts. It is necessary to point out, however, that whenever the unexpended portion of any one fund is invested separately, the total income from such investment during the year is the figure called for to be entered opposite that fund in the column "income of unexpended fund during the year" on schedules P and Q. The general income from investments should be apportioned over the endowment funds relatively to the unexpended amounts of the remaining funds.

SCHEDULE R: LOSSES AND GAINS ON GENERAL INVESTMENTS

This schedule exhibits the losses from sales of securities during the year, or gains from the same.

SCHEDULE S: SURPLUS ACCOUNTS

This schedule exhibits the three classes of surplus accounts corresponding to the three divisions of the balance sheet, schedule D.

BOOKKEEPING

As already mentioned, it is expected that these forms can be filled up by the treasurers of the various universities and colleges from their books, even though the methods of bookkeeping be quite different in the various institutions. It may be anticipated that some of the treasurers will find it necessary to analyze a number of their income and expense accounts to get amounts called for in the forms, but this will not be a serious matter after it has been done once.

It is doubtless impossible to provide an absolutely uniform system of bookkeeping among institutions of learning, but, if the forms here presented are to be generally adopted by the administrators of institutions in the publication of their annual financial reports, it would be exceedingly advantageous for the treasurers of the various institutions to alter the headings of the income and expense accounts in their ledgers so that the latter shall conform with the headings herein in order to facilitate the work of preparing the annual reports. The names of the accounts in the cash-

books and journals from which the entries are posted into the ledgers should also be changed correspondingly. All of these changes are simple ones and should not disturb materially sound accounting methods which may have been used in the past by the various institutions.

SUGGESTIONS INVITED

The treasurers or other officers of the various institutions are invited to send to the Carnegie Foundation for the Advancement of Teaching any suggestions which may occur to them relating to the improvement of the attached forms, and they are urged, even at the cost of some labor, to assist, so far as possible, in the effort to secure reports from all colleges which may be not only accurate, but also comparable with similar reports of other institutions.

HENRY S. PRITCHETT.

June, 1910.

**STANDARD FORMS FOR FINANCIAL REPORTS
OF
COLLEGES, UNIVERSITIES, AND TECHNICAL SCHOOLS**

Schedule A

SUMMARIES

FOR YEAR.....

INCOME AND EXPENDITURE

Total income for year, *Schedule B-1*

Total expenditure for year, *Schedule C-1*

Net surplus or deficit for year.....

ASSETS AND LIABILITIES

Current assets at end of year, *Schedule D*

Current liabilities at end of year, *Schedule D*

Surplus or deficit of current assets

Investment assets at end of year, *Schedule D*

Investment liabilities at end of year, *Schedule D*

Surplus or deficit of investment assets.....

EDUCATIONAL PLANT

Value of lands, buildings, and equipment, *Schedule D*.....

Debt: mortgages, notes, etc., against plant, *Schedule D*.....

Net investment in educational plant

Schedule B-1

INCOME

DESCRIPTION	Items	Totals
INCOME FROM STUDENTS:		
Tuition fees, <i>Schedule B-3</i>		
Incidental fees, matriculation fees		
Special fees for libraries, laboratories, degrees, etc.		
For supplies, chemicals, laboratory materials, etc.		
For dormitories (net), <i>detail sheet</i>		
For dining-halls (net), <i>detail sheet</i>		
INCOME FROM INVESTMENTS OF:		
Endowments for general purposes, <i>Schedule P</i>		
Endowments for designated purposes, <i>Schedule Q</i>		
Other Investments (if any)		
INCOME FROM GRANTS BY NATION, STATE, AND SPECIAL TAXATION		
State aid: Income from endowment granted by state		
Tax levy for current expenses (rate mills)		
Appropriation for current expenses		
Tax levy for buildings or for other special purposes		
Appropriations for buildings or for other special purposes		
Federal aid: Income from land grant, act of July 2, 1862		
Income from other land grants		
Additional endowment acts of August 30, 1890, and March 4, 1907		
GIFTS FOR CURRENT EXPENSES:		
For General Purposes		
(Details)		
For Designated Purposes		
(Details, such as gifts for immediate use on lands, buildings, etc.)		
INCOME FROM OTHER SOURCES:		
(Details)		
TOTAL INCOME		

RECEIPTS FROM TUITIONS

Schedule B-2

	College of Liberal Arts	Law School	Medical School	Etc.
Number of students registered.....				
Number of students paying full tuition.....				
Receipts from students paying full tuition				
Number of students paying part tuition.....				
Receipts from students paying part tuition.....				
Number of students admitted without payment.....				
Total receipts of tuition from all students.....				
Total amount of tuition paid from scholarship or fellowship funds.....				
Total receipts on account of tuition corresponding to first item under income, <i>Schedule B-1</i>				
Average tuition paid per student in each school or department.....				

Schedule C-1

EXPENSE

DESCRIPTION	Items	Totals
DEPARTMENTAL EXPENSES: Details in Schedule C-2		
College of Liberal Arts		
College of Engineering		
Law School		
Medical School		
Dental School		
Teachers' College		
Agricultural School		
Graduate School		
Other Colleges, or Schools		
(Details)		
ADMINISTRATION AND GENERAL EXPENSES:		
Salaries of officers		
(Details)		
Salaries of assistants, stenographers, etc.		
(Details)		
Expense of administrative officers		
(Details)		
Advertising		
(Details)		
Insurance		
(Details)		
Publication Expenses		
(Details)		
Purchases of Books, Supplies, etc.		
(Details)		
Other General Expenses		
(Details)		
OPERATION AND MAINTENANCE OF PLANT:		
Salaries and wages of janitors, care-takers, etc.		
Mechanicians' wages		
Laborers' wages		
Light, heat and power		
Undergraduate labor		
Repairs		
(Details)		
Depreciation		
(Details)		
EXPENSES OF PRODUCTIVE REAL ESTATE:		
(Details, or Schedule)		
MISCELLANEOUS EXPENSES:		
(Details)		
TOTAL.....		
INTEREST		
(Details)		
TOTAL EXPENSE		

DEPARTMENTAL EXPENSES

COLLEGE OR DEPARTMENT	Salaries Professors	Salaries In- structors	Salaries As- sistants	Total Salaries Teaching Staff	Pay, Clerks and stenographers	Library Budget	Laboratory Budget	Re- search	Mis- cella- neous	Total Cost of College or De- part- ment
COLLEGE OF LIBERAL ARTS										
Mathematics										
English										
Physics										
Chemistry										
Philosophy										
etc.										
W SCHOOL										
MEDICAL SCHOOL										

BALANCE
FOR THE

1. CURRENT ASSETS

Cash in banks and on hand for current expenses, *Schedule E*\$
 Notes receivable and interest accrued thereon, *Schedule F-1*.....
 Accounts receivable, *Schedule F-2*
 Rents receivable, *Schedule F-3*
 Interest and dividends accrued on bonds, mortgages and stocks, *Schedules G-1 and G-2*.....
 Other current assets
 Total current assets
 Deficiency of current assets (if any).....\$

2. INVESTMENT ASSETS AT END OF YEAR

Securities, *Schedule H*\$
 Real estate, *Schedule I*
 Cash in banks, for investments, *Schedule E*.....

 Total investment assets
 Deficiency of investment assets (if any).....

Total\$

3. EDUCATIONAL PLANT, LANDS, BUILDINGS, AND EQUIPMENT

Balance at beginning of year, *Schedule J*\$
 Additions during year, *Schedule K*.....
 Total.....
 Less Depreciation, *Schedule L*.....
 Balance at end of year, *Schedule J*\$
 Total Educational Plant.....\$

Schedule D

SHEET

' THE YEAR

1. CURRENT LIABILITIES

 s payable and interest accrued thereon, *Schedule M*\$
 unts payable, *Schedule N*
 est accrued on bonds and mortgages, *Schedule O*
 r current liabilities
 tal current liabilities
 lus of current assets (if any)
 tal\$

2. ENDOWMENT FUNDS, ETC., AT END OF YEAR

 is or mortgages, against investments, *Schedule O*\$
 MENTS CAPITAL ACCOUNTS:
 is for general purposes, invested, *Schedule P*
 is for designated purposes, invested, *Schedule Q*
 or Loss on General Investments, *Schedule R*
 tal invested funds\$
 s INCOME, INVESTED, *Schedule S*:
 s endowments for general purposes, etc.
 s endowments for designated purposes
 tal liabilities endowment funds, and surplus against investments\$

3. EDUCATIONAL PLANT. ENDOWMENTS AND CAPITAL ACCOUNTS

 gages on Lands, Buildings, etc., *Schedule O*\$
 wments expended upon Lands, Buildings, etc., *Schedules P and Q*
 lus Income expended upon Lands, Buildings, etc., *Schedule S*
 tal Educational Plant\$

Schedule E

CASH RECEIPTS AND DISBURSEMENTS

FOR ALL PURPOSES DURING THE YEAR

TOTAL CASH RECEIPTS.....	\$	
TOTAL CASH DISBURSEMENTS.....	\$	
Excess of Receipts (or Disbursements).....	\$	
CASH BALANCE at beginning of year.....	\$	
CASH BALANCE at end of year.....	\$	

CASH BALANCE

AT END OF YEAR

CASH ON DEPOSIT at banks:

(Details as to cash for immediate use and for investments)

.....

.....

..... \$

CASH at offices:

(Details as to cash for immediate use and for investments)

.....

.....

..... \$

CASH BALANCE, as above..... \$

NOTES RECEIVABLE

Schedule F-1

DESCRIPTION OF NOTES AND SECURITY THEREFOR IF ANY	Date of note	Date when due	Amount	Rate of Interest
Total.....				
rest accrued at beginning of year	\$			
rest earned during year.....	\$			
	\$			
rest received during year	\$			
rest accrued at end of year.....	\$			
d notes and interest accrued.....	\$			

Schedule F-2

ACCOUNTS RECEIVABLE

FOR TUITION :

(Details arranged alphabetically)

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MISCELLANEOUS :

(Details)

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Schedule F-3

RENTS RECEIVABLE

ARREARS OF RENTS at beginning of year.....\$
RENTS due during year\$
Total\$
COLLECTIONS OF RENTS during year.....\$
ARREARS OF RENTS at end of year.....\$

Schedule F-4

NET INCOME FROM RENTS

	<i>Real Estate belonging to the General Investments</i>	<i>Real Estate belonging to the Special Investments</i>
RENTS due during year	\$	\$
EXPENSES: Taxes	\$	\$
Insurance.....	\$	\$
Repairs.....	\$	\$
Commissions.....	\$	\$
Miscellaneous.....	\$	\$
Total Operating Expenses	\$	\$
Depreciation Charged.....	\$	\$
Total	\$	\$
NET INCOME (or NET DEFICIT) for year.....	\$	\$

Schedule G-1

INTEREST AND DIVIDENDS ACCRUED ON SECURITIES

GENERAL INVESTMENTS

INTEREST AND DIVIDENDS accrued at beginning of year.....\$
INTEREST AND DIVIDENDS earned during year.....\$
Total.....\$
INTEREST AND DIVIDENDS received during year.....\$
INTEREST AND DIVIDENDS accrued at end of year.....\$

Schedule G-2

INTEREST AND DIVIDENDS ACCRUED ON SECURITIES

SPECIAL INVESTMENTS

INTEREST AND DIVIDENDS accrued at beginning of year.....\$
INTEREST AND DIVIDENDS earned during year.....\$
Total.....\$
INTEREST AND DIVIDENDS received during year.....\$
INTEREST AND DIVIDENDS accrued at end of year.....\$

Schedule H

SECURITIES: BONDS, STOCKS, AND REAL ESTATE MORTGAGES

DESCRIPTION OF SECURITIES	Balance at beginning of year. Cost	Purchases during year. Cost	Sales during year. Cost	Balance at end of year. Cost	Interest Received	Interest Accrued
1: Illinois Central R.R. Co.'s 4's, due etc. etc.						
2: James American Smelting & Refining Preferred etc. etc.						
ESTATE MORTGAGES: Julia Page, on 41 W. 47th St., New York, 4½ %, due 1910 etc. etc.						
Total						

Schedule I

**INVESTMENTS IN REAL ESTATE OTHER THAN
UNIVERSITY, OR COLLEGE, GROUNDS AND BUILDINGS**

DESCRIPTION OF PROPERTIES	<i>Balance at begin- ning of year. Cost</i>	<i>Pur- chases during year. Cost</i>	<i>Sales during year. Cost</i>	<i>Balance at end of year. Cost</i>

Schedule J

EDUCATIONAL PLANT: LANDS, BUILDINGS, AND EQUIPMENT

ACCOUNT	Balance at beginning of year. Cost	Purchases during year. Cost	Sales during year. Cost	Balance at end of year. Cost
UNIVERSITY SITE, CAMPUS, GROUNDS, ETC. ¹				
GRADING, PLANTING, ROADS, WALKS, ETC. ¹				
BUILDINGS: ¹				
<i>(Details)</i>				
DEPARTMENTS' EQUIPMENT:				
.....Department				
Furniture and fixtures				
Library				
Collections				
etc.				
.....Department				
Furniture and fixtures				
Library				
Collections				
etc.				
DORMITORIES:				
Furniture and fixtures				
etc.				
DINING HALL				
Furniture and fixtures				
etc.				

¹If for any reason these items are omitted, a full statement of the cost, dimensions, and other details should be prepared. There should be a full and historically correct statement of the cost of the grounds and buildings, somewhat as follows:

The college grounds were acquired in in the following manner and at the following cost (*here give full particulars*).

The main building (used for recitation rooms and for the executive offices) is about by built of granite and brick, and was erected in at a cost of \$ the funds being provided as follows (*here give full particulars*).

.....Hall is about by of brick with stone trimming and is used for purposes. It was built in and cost about \$ the funds being provided as follows (*here give full particulars*).

Schedule K

ADDITIONS TO LANDS, BUILDINGS, AND EQUIPMENT

ADDITIONS TO LANDS \$

(Details)

ADDITIONS TO BUILDINGS \$

(Details)

ADDITIONS TO EQUIPMENT \$

(Details)

Total during year \$

Schedule L

**RESERVE FOR DEPRECIATION
ON LANDS, BUILDINGS, AND EQUIPMENT**

	<i>Balance of account at beginning of Year</i>	<i>Credits during the year</i>	<i>Extraor- dinary Re- pairs charged to Reserve during Year</i>	<i>Balance of account at End of Year</i>
For Depreciation on Buildings	\$	\$	\$	\$
For Depreciation on Equipment				
Less Appreciation on Land (if any)				
Total				
Balance of Reserve Account at End of Year				\$

Schedule M

31

Schedule N

ACCOUNTS PAYABLE

ACCOUNTS PAYABLE: Details

Schedule O

BONDS AND MORTGAGES

	<i>Against Investments</i>	<i>Against Educational Plant</i>	<i>Total</i>	<i>Interest accrued at end of year</i>
Bonds : <i>Details</i>				
MORTGAGES : <i>Details</i>				

Schedule R

GAINS AND LOSSES ON GENERAL INVESTMENTS

BALANCE OF ACCOUNT at beginning of year	\$
GAINS ON SALES of Securities during year	\$
Less Loss on Sales of Securities during year	
Net Gain (or Loss) during year	\$
Balance of account at end of year	\$

ENDOWMENT FUNDS FOR DESIGNATED PURPOSES

e various funds and
ources and purposes
be here described
at as shown on sche-

**MEDICAL EDUCATION
IN THE
UNITED STATES AND CANADA**

**A REPORT TO
THE CARNEGIE FOUNDATION
FOR THE ADVANCEMENT OF TEACHING**

**BY
ABRAHAM FLEXNER**

**WITH AN INTRODUCTION BY
HENRY S. PRITCHETT
PRESIDENT OF THE FOUNDATION**

BULLETIN NUMBER FOUR

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C

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INTRODUCTION

THE present report on medical education forms the first of a series of papers on professional schools to be issued by the Carnegie Foundation. The preparation of these papers has grown naturally out of the situation with which the trustees of the Foundation were confronted when they took up the trust committed to them.

When the work of the Foundation began five years ago the trustees found themselves intrusted with an endowment to be expended for the benefit of teachers in the colleges and universities of the United States, Canada, and Newfoundland. It required but the briefest examination to show that amongst the thousand institutions in English-speaking North America which bore the name college or university there was little unity of purpose or of standards. A large majority of all the institutions in the United States bearing the name college were really concerned with secondary education.

Under these conditions the trustees felt themselves compelled to begin a critical study of the work of the college and of the university in different parts of this wide area, and to commend to colleges and universities the adoption of such standards as would intelligently relate the college to the secondary school and to the university. While the Foundation has carefully refrained from attempting to become a standardizing agency, its influence has been thrown in the direction of a differentiation between the secondary school and the college, and between the college and the university. It is indeed only one of a number of agencies, including the stronger colleges and universities, seeking to bring about in American education some fair conception of unity and the attainment ultimately of a system of schools intelligently related to each other and to the ambitions and needs of a democracy.

At the beginning, the Foundation naturally turned its study to the college, as that part of our educational system most directly to be benefited by its endowment. Inevitably, however, the scrutiny of the college led to the consideration of the relations between the college or university and the professional schools which had gathered about it or were included in it. The confusion found here was quite as great as that which exists between the field of the college and that of the secondary school. Colleges and universities were discovered to have all sorts of relations to their professional schools of law, of medicine, and of theology. In some cases these relations were of the frailest texture, constituting practically only a license from the college by which a proprietary medical school or law school was enabled to live under its name. In other cases the medical school was incorporated into the college or university, but remained an *imperium in imperio*, the college assuming no responsibility for its standards or its support. In yet other cases the college or university assumed partial obligation of support, but no responsibility for the standards of the professional school, while in only a relatively small number of cases was the school of law or of medicine an integral part of the university, receiving from it university standards and adequate

maintenance. For the past two decades there has been a marked tendency to set up some connection between universities and detached medical schools, but under the very loose construction just referred to.

Meanwhile the requirements of medical education have enormously increased. The fundamental sciences upon which medicine depends have been greatly extended. The laboratory has come to furnish alike to the physician and to the surgeon a new means for diagnosing and combating disease. The education of the medical practitioner under these changed conditions makes entirely different demands in respect to both preliminary and professional training.

Under these conditions and in the face of the advancing standards of the best medical schools it was clear that the time had come when the relation of professional education in medicine to the general system of education should be clearly defined. The first step towards such a clear understanding was to ascertain the facts concerning medical education and the medical schools themselves at the present time. In accordance, therefore, with the recommendation of the president and the executive committee, the trustees of the Carnegie Foundation at their meeting in November, 1908, authorized a study and report upon the schools of medicine and law in the United States and appropriated the money necessary for this undertaking. The present report upon medical education, prepared, under the direction of the Foundation, by Mr. Abraham Flexner, is the first result of that action.

No effort has been spared to procure accurate and detailed information as to the facilities, resources, and methods of instruction of the medical schools. They have not only been separately visited, but every statement made in regard to each detail has been carefully checked with the data in possession of the American Medical Association, likewise obtained by personal inspection, and with the records of the Association of American Medical Colleges, so far as its membership extends. The details as stated go forth with the sanction of at least two, and frequently more, independent observers.

In making this study the schools of all medical sects have been included. It is clear that so long as a man is to practise medicine, the public is equally concerned in his right preparation for that profession, whatever he call himself,—allopath, homeopath, eclectic, osteopath, or whatnot. It is equally clear that he should be grounded in the fundamental sciences upon which medicine rests, whether he practises under one name or under another.

It will be readily understood that the labor involved in visiting 150 such schools is great, and that in the immense number of details dealt with it is altogether impossible to be sure that every minute fact concerning these institutions has been ascertained and set down. While the Foundation cannot hope to obtain in so great an undertaking absolute completeness in every particular, such care has been exercised, and the work has been so thoroughly reviewed by independent authorities, that the statements which are given here may be confidently accepted as setting

forth the essential facts respecting medical education and respecting the institutions which deal with it.

In this connection it is perhaps desirable to add one further word. Educational institutions, particularly those which are connected with a college or a university, are peculiarly sensitive to outside criticism, and particularly to any statement of the circumstances of their own conduct or equipment which seems to them unfavorable in comparison with that of other institutions. As a rule, the only knowledge which the public has concerning an institution of learning is derived from the statements given out by the institution itself, information which, even under the best circumstances, is colored by local hopes, ambitions, and points of view. A considerable number of colleges and universities take the unfortunate position that they are private institutions and that the public is entitled to only such knowledge of their operations as they choose to communicate. In the case of many medical schools the aversion to publicity is quite as marked as it is reputed to be in the case of certain large industrial trusts. A few institutions questioned the right of any outside agency to collect and publish the facts concerning their medical schools. The Foundation was called upon to answer the question: Shall such an agency as the Foundation, dedicated to the betterment of American education, make public the facts concerning the medical schools of the United States and Canada?

The attitude of the Foundation is that all colleges and universities, whether supported by taxation or by private endowment, are in truth public service corporations, and that the public is entitled to know the facts concerning their administration and development, whether those facts pertain to the financial or to the educational side. We believe, therefore, that in seeking to present an accurate and fair statement of the work and the facilities of the medical schools of this country, we are serving the best possible purpose which such an agency as the Foundation can serve; and, furthermore, that only by such publicity can the true interests of education and of the universities themselves be subserved. In such a reasonable publicity lies the hope for progress in medical education.

I wish to add with pleasure that notwithstanding reluctance in some quarters to furnish information, the medical schools of the colleges and universities, as well as proprietary and independent medical schools, have generally accepted the view just stated and have seconded the work of the Foundation by offering to those who were engaged in this study every facility to learn their opportunities and resources; and I beg to express the thanks of the trustees of the Foundation to each of these institutions for the coöperation which it has given to a study which, in the very nature of the case, was to bear sharply in the way of criticism upon many of those called on for coöperation.

The report which follows is divided into two parts. In the first half the history of medical education in this country and its present status are set forth. The story is there told of the gradual development of the commercial medical school, distinctly

INTRODUCTION

an American product, of the modern movement for the transfer of medical education to university surroundings, and of the effort to procure stricter scrutiny of those seeking to enter the profession. The present status of medical education is then fully described and a forecast of possible progress in the future is attempted. The second part of the report gives in detail a description of the schools in existence in each state of the Union and in each province of Canada.

It is the purpose of the Foundation to proceed at once with a similar study of medical education in Great Britain, Germany, and France, in order that those charged with the reconstruction of medical education in America may profit by the experience of other countries.

The striking and significant facts which are here brought out are of enormous consequence not only to the medical practitioner, but to every citizen of the United States and Canada; for it is a singular fact that the organization of medical education in this country has hitherto been such as not only to commercialize the process of education itself, but also to obscure in the minds of the public any discrimination between the well trained physician and the physician who has had no adequate training whatsoever. As a rule, Americans, when they avail themselves of the services of a physician, make only the slightest inquiry as to what his previous training and preparation have been. One of the problems of the future is to educate the public itself to appreciate the fact that very seldom, under existing conditions, does a patient receive the best aid which it is possible to give him in the present state of medicine, and that this is due mainly to the fact that a vast army of men is admitted to the practice of medicine who are untrained in sciences fundamental to the profession and quite without a sufficient experience with disease. A right education of public opinion is one of the problems of future medical education.

The significant facts revealed by this study are these:

(1) For twenty-five years past there has been an enormous over-production of uneducated and ill trained medical practitioners. This has been in absolute disregard of the public welfare and without any serious thought of the interests of the public. Taking the United States as a whole, physicians are four or five times as numerous in proportion to population as in older countries like Germany.

(2) Over-production of ill trained men is due in the main to the existence of a very large number of commercial schools, sustained in many cases by advertising methods through which a mass of unprepared youth is drawn out of industrial occupations into the study of medicine.

(3) Until recently the conduct of a medical school was a profitable business, for the methods of instruction were mainly didactic. As the need for laboratories has become more keenly felt, the expenses of an efficient medical school have been greatly increased. The inadequacy of many of these schools may be judged from the fact that nearly half of all our medical schools have incomes below \$10,000, and these incomes determine the quality of instruction that they can and do offer.

Colleges and universities have in large measure failed in the past twenty-five years to appreciate the great advance in medical education and the increased cost of teaching it along modern lines. Many universities desirous of apparent educational completeness have annexed medical schools without making themselves responsible either for the standards of the professional schools or for their support.

(4) The existence of many of these unnecessary and inadequate medical schools has been defended by the argument that a poor medical school is justified in the interest of the poor boy. It is clear that the poor boy has no right to go into any profession for which he is not willing to obtain adequate preparation; but the facts set forth in this report make it evident that this argument is insincere, and that the excuse which has hitherto been put forward in the name of the poor boy is in reality an argument in behalf of the poor medical school.

(5) A hospital under complete educational control is as necessary to a medical school as is a laboratory of chemistry or pathology. High grade teaching within a hospital introduces a most wholesome and beneficial influence into its routine. Trustees of hospitals, public and private, should therefore go to the limit of their authority in opening hospital wards to teaching, provided only that the universities secure sufficient funds on their side to employ as teachers men who are devoted to clinical science.

In view of these facts, progress for the future would seem to require a very much smaller number of medical schools, better equipped and better conducted than our schools now as a rule are; and the needs of the public would equally require that we have fewer physicians graduated each year, but that these should be better educated and better trained. With this idea accepted, it necessarily follows that the medical school will, if rightly conducted, articulate not only with the university, but with the general system of education. Just what form that articulation must take will vary in the immediate future in different parts of the country. Throughout the eastern and central states the movement under which the medical school articulates with the second year of the college has already gained such impetus that it can be regarded as practically accepted. In the southern states for the present it would seem that articulation with the four-year high school would be a reasonable starting-point for the future. In time the development of secondary education in the south and the growth of the colleges will make it possible for southern medical schools to accept the two-year college basis of preparation. With reasonable prophecy the time is not far distant when, with fair respect for the interests of the public and the need for physicians, the articulation of the medical school with the university may be the same throughout the entire country. For in the future the college or the university which accepts a medical school must make itself responsible for university standards in the medical school and for adequate support for medical education. The day has gone by when any university can retain the respect of educated men, or when it can fulfil its duty to education, by retaining a low grade professional school for the sake of its own institutional completeness.

If these fundamental principles can be made clear to the people of the United States and of Canada, and to those who govern the colleges and the universities, we may confidently expect that the next ten years will see a very much smaller number of medical schools in this country, but a greatly increased efficiency in medical education, and that during the same period medical education will become rightly articulated with, and rightly related to, the general educational system of the whole country.

In the suggestions which are made in this report looking toward the future development of medicine, it ought to be pointed out that no visionary or impossible achievement is contemplated. It is not expected that a Johns Hopkins Medical School can be erected immediately in cities where public support of education has hitherto been meager. Nevertheless, it is quite true that there is a certain minimum of equipment and a minimum of educational requirement without which no attempt ought to be made to teach medicine. Hitherto not only proprietary medical schools, but colleges and universities, have paid scant attention to this fact. They have been ready to assume the responsibility of turning loose upon a helpless community men licensed to the practice of medicine without any serious thought as to whether they had received a fair training or not. To-day, under the methods pursued in modern medicine, we know with certainty that a medical school cannot be conducted without a certain minimum of expense and without a certain minimum of facilities. The institution which attempts to conduct a school below this plane is clearly injuring, not helping, civilization. In the suggestions which are made in this report as to what constitutes a reasonable minimum no visionary ideal has been pursued, but only such things have been insisted upon as in the present light of our American civilization every community has a right to demand of its medical school, if medicine is to be taught at all.

It seems desirable also in connection with both the medical school and the university or college to add one word further concerning the relation of financial support to efficiency and sincerity. Where any criticism is attempted of inadequate methods or inadequate facilities, no reply is more common than this: "Our institution cannot be judged from its financial support. It depends upon the enthusiasm and the devotion of its teachers and its supporters, and such devotion cannot be measured by financial standards."

Such an answer contains so fine a sentiment and so pregnant a truth that it often-times serves to turn aside the most just criticism. It is true that every college must ultimately depend upon the spirit and devotion of those who work in it, but behind this noble statement hides most of the insincerity, sham, and pretense not only of the American medical school, but of the American college. The answer quoted is commonly made by the so-called university that, with an income insufficient to support a decent college, is trying to cover the whole field of university education. It is the same answer that one receives from the medical school which, with wholly inadequate facilities, is turning out upon an innocent and long-suffering community men

who must get their medical education after they get out of the institution. In many of these ill manned and poorly equipped institutions there is to be found a large measure of devotion, but the fact remains that such devotion is usually ill placed, and the individual who gives it loses sight of the interests of education and of the general public in his desire to keep alive an institution without reason or right to exist.

It will, however, be urged by weak schools that the fact that an institution is ill manned and poorly equipped is inconclusive; that in the time devoted to the examination of a single school it is impossible to do it justice. Objection of this kind is apt to come from schools of two types,—ineffective institutions in large cities, and schools attached to colleges in small towns in which clinical material is scarce. In my opinion the objection is without force. A trained observer of wide experience can go directly to the heart of a problem of this character. The spirit, ideals, and facilities of a professional or technical school can be quickly grasped. In every instance in which further inquiry has been made, the conclusions reached by the author of the report have been sustained.

The development which is here suggested for medical education is conditioned largely upon three factors: first, upon the creation of a public opinion which shall discriminate between the ill trained and the rightly trained physician, and which will also insist upon the enactment of such laws as will require all practitioners of medicine, whether they belong to one sect or another, to ground themselves in the fundamentals upon which medical science rests; secondly, upon the universities and their attitude towards medical standards and medical support; finally, upon the attitude of the members of the medical profession towards the standards of their own practice and upon their sense of honor with respect to their own profession.

These last two factors are moral rather than educational. They call for an educational patriotism on the part of the institutions of learning and a medical patriotism on the part of the physician.

By educational patriotism I mean this: a university has a mission greater than the formation of a large student body or the attainment of institutional completeness, namely, the duty of loyalty to the standards of common honesty, of intellectual sincerity, of scientific accuracy. A university with educational patriotism will not take up the work of medical education unless it can discharge its duty by it; or if, in the days of ignorance once winked at, a university became entangled in a medical school alliance, it will frankly and courageously deal with a situation which is no longer tenable. It will either demand of its medical school university ideals and give it university support, or else it will drop the effort to do what it can only do badly.

By professional patriotism amongst medical men I mean that sort of regard for the honor of the profession and that sense of responsibility for its efficiency which will enable a member of that profession to rise above the consideration of personal

or of professional gain. As Bacon truly wrote, "Every man owes a duty to his profession," and in no profession is this obligation more clear than in that of the modern physician. Perhaps in no other of the great professions does one find greater discrepancies between the ideals of those who represent it. No members of the social order are more self-sacrificing than the true physicians and surgeons, and of this fine group none deserve so much of society as those who have taken upon their shoulders the burden of medical education. On the other hand, the profession has been diluted by the presence of a great number of men who have come from weak schools with low ideals both of education and of professional honor. If the medical education of our country is in the immediate future to go upon a plane of efficiency and of credit, those who represent the higher ideals of the medical profession must make a stand for that form of medical education which is calculated to advance the true interests of the whole people and to better the ideals of medicine itself.

There is raised in the discussion of this question a far-reaching economic problem to which society has as yet given little attention; that is to say, What safeguards may society and the law throw about admission to a profession like that of law or of medicine in order that a sufficient number of men may be induced to enter it and yet the unfit and the undesirable may be excluded?

It is evident that in a society constituted as are our modern states, the interests of the social order will be served best when the number of men entering a given profession reaches and does not exceed a certain ratio. For example, in law and medicine one sees best in a small village the situation created by the over-production of inadequately trained men. In a town of two thousand people one will find in most of our states from five to eight physicians where two well trained men could do the work efficiently and make a competent livelihood. When, however, six or eight ill trained physicians undertake to gain a living in a town which can support only two, the whole plane of professional conduct is lowered in the struggle which ensues, each man becomes intent upon his own practice, public health and sanitation are neglected, and the ideals and standards of the profession tend to demoralization.

A similar state of affairs comes from the presence of too large a number of ill trained lawyers in a community. When six or eight men seek to gain their living from the practice of the law in a community in which, at the most, two good lawyers could do all the work, the demoralization to society becomes acute. Not only is the process of the law unduly lengthened, but the temptation is great to create business. No small proportion of the American lack of respect for the law grows out of the presence of this large number of ill trained men seeking to gain a livelihood from the business which ought in the nature of the case to support only a much smaller number. It seems clear that as nations advance in civilization, they will be driven to throw around the admission to these great professions such safeguards as will limit the number of those who enter them to some reasonable estimate of the number who are actually needed. It goes without saying that no system of stan-

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dards of admission to a profession can exclude all the unfit or furnish a perfect body of practitioners, but a reasonable enforcement of such standards will at least relieve the body politic of a large part of the difficulty which comes from over-production, and will safeguard the right of society to the service of trained men in the great callings which touch so closely our physical and political life.

The object of the Foundation in undertaking studies of this character is to serve a constructive purpose, not a critical one. Unless the information here brought together leads to constructive work, it will fail of its purpose. The very disappearance of many existing schools is part of the reconstructive process. Indeed, in the course of preparing the report a number of results have already come about which are of the highest interest from the constructive point of view. Several colleges, finding themselves unable to carry on a medical school upon right lines, have, frankly facing the situation, discontinued their medical departments, the result being a real gain to medical education. Elsewhere, competing medical schools which were dividing the students and the hospital facilities have united into a single school. In still other instances large sums of money have been raised to place medical education on a firmer basis.

In the preparation of this report the Foundation has kept steadily in view the interests of two classes, which in the over-multiplication of medical schools have usually been forgotten,—first, the youths who are to study medicine and to become the future practitioners, and, secondly, the general public, which is to live and die under their ministrations.

No one can become familiar with this situation without acquiring a hearty sympathy for the American youth who, too often the prey of commercial advertising methods, is steered into the practice of medicine with almost no opportunity to learn the difference between an efficient medical school and a hopelessly inadequate one. A clerk who is receiving \$50 a month in the country store gets an alluring brochure which paints the life of the physician as an easy road to wealth. He has no realization of the difference between medicine as a profession and medicine as a business, nor as a rule has he any adviser at hand to show him that the first requisite for the modern practitioner of medicine is a good general education. Such a boy falls an easy victim to the commercial medical school, whether operating under the name of a university or college, or alone.

The interests of the general public have been so generally lost sight of in this matter that the public has in large measure forgot that it has any interests to protect. And yet in no other way does education more closely touch the individual than in the quality of medical training which the institutions of the country provide. Not only the personal well-being of each citizen, but national, state, and municipal sanitation rests upon the quality of the training which the medical graduate has received. The interest of the public is to have well trained practitioners in sufficient number for the needs of society. The source whence these practitioners are to come is of far less consequence.

In view of this fact, the argument advanced for the retention of medical schools in places where good clinical instruction is impossible is directly against the public interest. If the argument were valid, it would mean that the sick man is better off in the hands of an incompetent home-grown practitioner than in those of one well trained in an outside school. Such an argument ought no longer to blind the eyes of intelligent men to the actual situation. Any state of the Union or any province of Canada is better off without a medical school than with one conducted in a commercial spirit and below a reasonable plane of efficiency. No state and no section of a state capable of supporting a good practitioner will suffer by following this policy. The state of Washington, which has no medical school within its borders, is doubtless supplied with as capable and well trained a body of medical practitioners as is Missouri with its eleven medical schools or Illinois with its fourteen.

The point of view which keeps in mind the needs and qualifications of the medical student and the interests of the great public is quite a different one from that which the institution which conducts a medical department ordinarily occupies. The questions which look largest to the institutions are: Can we add a medical school to our other departments? and if so, where can we find the students? The questions which the other point of view suggest are: Is a medical school needed? Cannot those qualified to study medicine find opportunities in existing schools? If not, are the means and the facilities at hand for teaching medicine on a right basis?

While the aim of the Foundation has throughout been constructive, its attitude towards the difficulties and problems of the situation is distinctly sympathetic. The report indeed turns the light upon conditions which, instead of being fruitful and inspiring, are in many instances commonplace, in other places bad, and in still others, scandalous. It is nevertheless true that no one set of men or no one school of medicine is responsible for what still remains in the form of commercial medical education. Our hope is that this report will make plain once for all that the day of the commercial medical school has passed. It will be observed that, except for a brief historical introduction, intended to show how present conditions have come about, no account is given of the past of any institution. The situation is described as it exists to-day in the hope that out of it, quite regardless of the past, a new order may be speedily developed. There is no need now of recriminations over what has been, or of apologies by way of defending a régime practically obsolete. Let us address ourselves resolutely to the task of reconstructing the American medical school on the lines of the highest modern ideals of efficiency and in accordance with the finest conceptions of public service.

It is hoped that both the purpose of the Foundation and its point of view as thus stated may be remembered in any consideration of the report which follows, and that this publication may serve as a starting-point both for the intelligent citizen and for the medical practitioner in a new national effort to strengthen the medical profession and rightly to relate medical education to the general system of schools of our nation.

INTRODUCTION

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The Foundation is under the greatest obligation in the preparation of this report to leading representatives of medicine and surgery in this country for their coöperation and advice. The officers of the various medical associations and of the Association of American Medical Colleges have furnished information which was invaluable and have given aid in the most cordial way. We are particularly indebted for constant and generous assistance to Dr. William H. Welch of Johns Hopkins University, Dr. Simon Flexner of the Rockefeller Institute, and Dr. Arthur D. Bevan, chairman of the Council on Education of the American Medical Association. In addition, our acknowledgments are due to Dr. N. P. Colwell, secretary of the Council on Education of the American Medical Association, and to Dr. F. C. Zapffe, secretary of the Association of American Medical Colleges, for most helpful coöperation. I wish to acknowledge also our indebtedness to a number of eminent men connected with various schools of medicine who have been kind enough to read the proof of this report and to give us the benefit of their comment and criticism.

HENRY S. PRITCHETT.

April 18, 1910.

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PART I
MEDICAL EDUCATION
IN THE UNITED STATES AND CANADA

CHAPTER I

HISTORICAL AND GENERAL

THE American medical school is now well along in the second century of its history.¹ It began, and for many years continued to exist, as a supplement to the apprenticeship system still in vogue during the seventeenth and eighteenth centuries. The likely youth of that period, destined to a medical career, was at an early age indentured to some reputable practitioner, to whom his service was successively menial, pharmaceutical, and professional: he ran his master's errands, washed the bottles, mixed the drugs, spread the plasters, and finally, as the stipulated term drew towards its close, actually took part in the daily practice of his preceptor,—bleeding his patients, pulling their teeth, and obeying a hurried summons in the night. The quality of the training varied within large limits with the capacity and conscientiousness of the master. Ambitious spirits sought, therefore, a more assured and inspiring discipline. Beginning early in the eighteenth century, having served their time at home, they resorted in rapidly increasing numbers to the hospitals and lecture-halls of Leyden, Paris, London, and Edinburgh. The difficulty of the undertaking proved admirably selective; for the students who crossed the Atlantic gave a good account of themselves. Returning to their native land, they sought opportunities to share with their less fortunate or less adventurous fellows the rich experience gained as they “walked the hospitals” of the old world in the footsteps of Cullen, Munro, and the Hunters. The voices of the great masters of that day thus reëchoed in the recent western wilderness. High scientific and professional ideals impelled the youthful enthusiasts, who bore their lighted torches safely back across the waters.

Out of these early essays in medical teaching, the American medical school developed. As far back as 1750 informal classes and demonstrations, mainly in anatomy, are matters of record. Philadelphia was then the chief center of medical interest. There, in 1762, William Shippen the younger, after a sojourn of five years abroad, began in the very year of his return home, a course of lectures on midwifery. In the following autumn he announced a series of anatomical lectures “for the advantage of the young gentlemen now engaged in the study of physic in this and the neighboring provinces, whose circumstances and connections will not admit of their going abroad for improvement to the anatomical schools in Europe; and also for the entertainment of any gentlemen who may have the curiosity to understand the anatomy of the Human Frame.” From these detached courses the step to an organized medical school was taken at the instigation of Shippen's friend and fellow student abroad,

¹This statement has reference only to the United States and Canada, with which the present account alone deals. As a matter of fact, a chair of medicine was established at the University of Mexico towards the close of the sixteenth century. A complete medical school was there developed. James J. Walsh: “First American Medical School,” in *New York Medical Journal*, Oct. 10, 1908 (based on *Historia de la medicina en Mexico des de la epoca de los Indios, hasta la presente*. Por Francisco Flores. Mexico, 1886).

John Morgan, who in 1765 proposed to the trustees of the College of Philadelphia the creation of a professorship in the theory and practice of medicine. At the ensuing Commencement, Morgan delivered a noble and prophetic discourse, still pertinent, upon the institution of medical schools in America. The trustees were favorable to the suggestion; the chair was established, and Morgan himself was its first occupant. Soon afterwards Shippen became professor of anatomy and surgery. Thirteen years previously the Pennsylvania Hospital, conceived by Thomas Bond, had been established through the joint efforts of Bond himself and Benjamin Franklin. Realizing that the student "must Join Examples with Study, before he can be sufficiently qualified to prescribe for the sick, for Language and Books alone can never give him Adequate Ideas of Diseases and the best methods of Treating them," Bond now argued successfully in behalf of bedside training for the medical students. "There the Clinical professor comes in to the Aid of Speculation and demonstrates the Truth of Theory by Facts," he declared in words that a century and a half later still warrant repetition; "he meets his pupils at stated times in the Hospital, and when a case presents adapted to his purpose, he asks all those Questions which lead to a certain knowledge of the Disease and parts Affected; and if the Disease baffles the power of Art and the Patient falls a Sacrifice to it, he then brings his Knowledge to the Test, and fixes Honour or discredit on his Reputation by exposing all the Morbid parts to View, and Demonstrates by what means it produced Death, and if perchance he finds something unexpected, which Betrays an Error in Judgement, he like a great and good man immediately acknowledges the mistake, and, for the benefit of survivors, points out other methods by which it might have been more happily treated."¹ The writer of these sensible words fitly became our first professor of clinical medicine,² with unobstructed access to the one hundred and thirty patients then in the hospital wards. Subsequently the faculty of the new school was increased and greatly strengthened when Adam Kuhn, trained by Linnaeus, was made professor of *materia medica*, and Benjamin Rush, already at twenty-four on the threshold of his brilliant career, became professor of chemistry.

Our first medical school was thus soundly conceived as organically part of an institution of learning and intimately connected with a large public hospital. The instruction aimed, as already pointed out, not to supplant, but to supplement apprenticeship. A year's additional training, carrying the bachelor's degree, was offered to students who, having demonstrated a competent knowledge of Latin, mathematics, natural and experimental philosophy, and having served a sufficient apprenticeship to some reputable practitioner in physic, now completed a prescribed lecture curriculum, with attendance upon the practice of the Pennsylvania Hospital for one

¹ An essay on *The Utility of Clinical Lectures*, by Thomas Bond, 1766.

² There is no record of Dr. Bond's appointment, but in the minutes of the Hospital trustees he "is requested by the Trustees and Professors to continue his Clinical Lectures at the Hospital as a Branch of Medical Education." Quoted by Packard: *History of Medicine in the United States*, p. 201.

year. This course was well calculated to round off the young doctor's preparation, reviewing and systematizing his theoretical acquisitions, while considerably extending his practical experience.

Before the outbreak of the Revolution, the young medical school was prosperously started on its career. The war of course brought interruption and confusion. More unfortunate still, for the time being, was the local rivalry—ominous as the first of its kind—of the newly established medical department of the University of Pennsylvania; but wise counsels averted disaster, and in 1791 the two institutions joined to form a single faculty, bearing, as it still bears, the name of the university,—the earliest of a long and yet incomplete series of medical school mergers. Before the close of the century three more “medical institutes,” similar in style, had been started: one in 1768 in New York, as the medical department of King's College, which, however, temporarily collapsed on the British occupation and was only indirectly restored to vigor by union in 1814 with the College of Physicians and Surgeons, begun by the Regents in 1807; another, the medical department of Harvard College, opened in Cambridge in 1788, and twenty-seven years later removed to Boston so as to gain access to the hospitals there;¹ last of the group, the medical department of Dartmouth College, started in 1798 by a Harvard graduate, Dr. Nathan Smith, who was himself for twelve years practically its entire faculty—and a very able faculty at that.

The sound start of these early schools was not long maintained. Their scholarly ideals were soon compromised and then forgotten. True enough, from time to time seats of learning continued to create medical departments,—Yale in 1810, Transylvania in 1817, among others. But with the foundation early in the nineteenth century at Baltimore of a proprietary school, the so-called medical department of the so-called University of Maryland,² a harmful precedent was established.³ Before that a college of medicine had been a branch growing out of the living university trunk.

¹ The removal took place in 1810. But definite arrangements for clinical teaching long remained vague. Dr. R. C. Cabot quotes the *Harvard Catalogus* of 1833 as follows: “The lectures for medical students are delivered in Boston. . . . During lectures the students may find in the city various opportunities for practical instruction.” A hospital is first mentioned in 1835, “when it is stated that students may attend the medical visits at the Massachusetts General Hospital.” R. C. Cabot: “Sketch of the Development of the Department of Clinical Medicine,” in *Harvard Medical Alumni Quarterly*, Jan., 1904, p. 666.

² In recent years an effort has been made to fill out the non-existent university by an affiliation with St. John's College (Annapolis), whereby it becomes nominally the department of arts of the University of Maryland. This is, of course, a makeshift. A university begins with a school of arts and sciences; it cannot be formed of loosely associated schools of dentistry, pharmacy, and even law, whether with or without still looser connection with a remote college of arts. Analogous in type are the so-called medical departments of the Universities of Buffalo, Toledo, and Memphis, which at this writing still lack academic affiliation. Their titles cannot disguise the fact that they are in essence independent medical schools, nor does a university charter make a university.

³ This was in imitation of London, as against the Edinburgh or the Leyden example, followed by the four earlier schools. But the London schools never conferred the degree or gave the right to practise: for the bestowal of degrees is the function of a university, the qualification for practice is determined by the state. The American departure in both these respects developed evils from which England has never suffered.

This organic connection guaranteed certain standards and ideals, modest enough at that time, but destined to a development which medical education could, as experience proved, ill afford to forego. Even had the university relation been preserved, the precise requirements of the Philadelphia College would not indeed have been permanently tenable. The rapid expansion of the country, with the inevitable decay of the apprentice system in consequence, must necessarily have lowered the terms of entrance upon the study. But for a time only: the requirements of medical education would then have slowly risen with the general increase in our educational resources. Medical education would have been part of the entire movement instead of an exception to it. The number of schools would have been well within the number of actual universities, in whose development as respects endowments, laboratories, and libraries they would have partaken; and the country would have been spared the demoralizing experience in medical education from which it is but now painfully awakening.

Quite aside from the history, achievements, or present merits of any particular independent medical school, the creation of the type was the fertile source of unforeseen harm to medical education and to medical practice. Since that day medical colleges have multiplied without restraint, now by fission, now by sheer spontaneous generation. Between 1810 and 1840, twenty-six new medical schools sprang up; between 1840 and 1876, forty-seven more;¹ and the number actually surviving in 1876 has been since then much more than doubled. First and last, the United States and Canada have in little more than a century produced four hundred and fifty-seven medical schools, many, of course, short-lived, and perhaps fifty still-born.² One hundred and fifty-five survive to-day.³ Of these, Illinois, prolific mother of thirty-nine medical colleges, still harbors in the city of Chicago fourteen; forty-two sprang from the fertile soil of Missouri, twelve of them still "going" concerns; the Empire State produced forty-three, with eleven survivors;⁴ Indiana, twenty-seven, with two survivors; Pennsylvania, twenty, with eight survivors; Tennessee, eighteen, with nine survivors. The city of Cincinnati brought forth about twenty, the city of Louisville eleven. These enterprises—for the most part they can be called schools or institutions only by courtesy—were frequently set up regardless of opportunity or need: in small towns as readily as in large, and at times almost in the heart of the wilderness. No field, however limited, was ever effectually preëmpted. Wherever and whenever the roster of untitled practitioners rose above half a dozen, a medical school was likely at any moment to be precipitated. Nothing was really essential but

¹ *Contrib. to History of Med. Educat.*, N. S. Davis (Washington, 1877, p. 41).

² These were usually frauds, suppressed by police or by post-office departments. Postgraduate and osteopathic schools are not included in these figures.

³ Including osteopathic schools, of which there are eight, but not including postgraduate schools, of which there are thirteen, one of them in Kansas City without students at present. The last-named institution retains its organization in order to obtain staff recognition at the Kansas City Hospital.

⁴ Not including four postgraduate schools.

professors. The laboratory movement is comparatively recent; and Thomas Bond's wise words about clinical teaching were long since out of print. Little or no investment was therefore involved. A hall could be cheaply rented and rude benches were inexpensive. Janitor service was unknown and is even now relatively rare. Occasional dissections in time supplied a skeleton—in whole or in part—and a box of odd bones. Other equipment there was practically none. The teaching was, except for a little anatomy, wholly didactic. The schools were essentially private ventures, money-making in spirit and object. A school that began in October would graduate a class the next spring; it mattered not that the course of study was two or three years; immigration recruited a senior class at the start.¹ Income was simply divided among the lecturers, who reaped a rich harvest, besides, through the consultations which the loyalty of their former students threw into their hands. "Chairs" were therefore valuable pieces of property, their prices varying with what was termed their "reflex" value: only recently a professor in a now defunct Louisville school, who had agreed to pay \$3000 for the combined chair of physiology and gynecology, objected strenuously to a division of the professorship assigning him physiology, on the ground of "failure of consideration;" for the "reflex" which constituted the inducement to purchase went obviously with the other subject.² No applicant for instruction who could pay his fees or sign his note was turned down. State boards were not as yet in existence. The school diploma was itself a license to practise. The examinations, brief, oral, and secret, plucked almost none at all; even at Harvard, a student for whom a majority of nine professors "voted" was passed.³ The man who had settled his tuition bill was thus practically assured of his degree, whether he had regularly attended lectures or not. Accordingly, the business thrived. Rivalry between different so-called medical centers was ludicrously bitter. Still more acrid were—and occasionally are—the local animosities bound to arise in dividing or endeavoring to monopolize the spoils. Sudden and violent feuds thus frequently disrupted the faculties. But a split was rarely fatal: it was more likely to result in one more school. Occasionally, a single too masterful individual became the strategic object of a hostile faculty combination. Daniel Drake, indomitable pioneer in medical education up and down the Ohio Valley, thus tasted the ingratitude of his colleagues. As presiding officer of the faculty of the Medical College of Ohio, at Cincinnati, cornered by a cabal of men, only a year since indebted to him for their professorial titles and profits, he was compelled to put a motion for his own expulsion and to announce to his enemies a large major-

¹ This is recent as well as ancient history, *e.g.*:

	opened	1893	first class graduated	1894
Tufts College Medical School	"	1894	"	1895
Illinois Medical College	"	1894	"	1895
Birmingham Medical College	"	1896	"	1907
College of Physicians and Surgeons, Little Rock	"	1906	"	1907
College of Physicians and Surgeons, Memphis	"	1906	"	1907

² The sale of chairs is not even now wholly unknown. At the North Carolina Medical College (Charlotte, N. C.) the faculty owns the stock, and the sale of one's stock carries with it one's chair.

³ There were at Harvard at one time only seven professors and an examination was conducted even if only a majority was present.

ity in its favor. It is pleasant to record that the indefatigable man was not daunted. He continued from time to time to found schools and to fill professorships—at Lexington, at Philadelphia, at Oxford in Ohio, at Louisville, and finally again in that beloved Cincinnati, where he had been so hardly served. In the course of a busy and fruitful career, he had occupied eleven different chairs in six different schools, several of which he had himself founded; and he had besides traversed the whole country, as it then was, from Canada and the Great Lakes to the Gulf, and as far westward as Iowa, collecting material for his great work, historically a classic, *The Diseases of the Interior Valley of North America*.

In the wave of commercial exploitation which swept the entire profession so far as medical education is concerned, the original university departments were practically torn from their moorings. The medical schools of Harvard, Yale, Pennsylvania, became, as they expanded, virtually independent of the institutions with which they were legally united, and have had in our own day to be painfully won back to their former status.¹ For years they managed their own affairs, disposing of professorships by common agreement, segregating and dividing fees, along proprietary lines. In general, these indiscriminate and irresponsible conditions continued at their worst until well into the eighties. To this day it is as easy to establish a medical school as a business college,² though the inducement and tendency to do so have greatly weakened. Meanwhile, the entire situation had fundamentally altered. The preceptorial system, soon moribund, had become nominal. The student registered in the office of a physician whom he never saw again. He no longer read his master's books, submitted to his quizzing, or rode with him the countryside in the enjoyment of valuable bedside opportunities. All the training that a young doctor got before beginning his practice had now to be procured within the medical school. The school was no longer a supplement; it was everything. Meanwhile, the practice of medicine was itself becoming quite another thing. Progress in chemical, biological, and physical science was increasing the physician's resources, both diagnostic and remedial. Medicine, hitherto empirical, was beginning to develop a scientific basis and method. The medical schools had thus a different function to perform: it took them upwards of half a century to wake up to the fact. The stethoscope had been in use for over thirty years before, as Dr. Cabot notes,³ its first mention in the catalogue of the Harvard Medical School in 1868-9; the microscope is first mentioned

¹The first step towards depriving the medical school of virtual autonomy was taken when the university undertook to collect the fees and thenceforward to administer the finances of the department by means of an annual budget. This took place at Harvard in 1871, at Yale in 1880, at the University of Pennsylvania in 1896. The scope of the medical faculty has gradually shrunk since. Columbia, which gave up its medical department to the College of Physicians and Surgeons in 1814, contracted a nominal relation with that school in 1860; in 1891 the connection became organic.

²In New York, however, the chartering of educational institutions is in the hands of the Regents, who have large powers. Nevertheless, they have recently given a limited charter to the Brooklyn Postgraduate School, a corporation practically without resources and relying on hospital and student fee income (the latter thus far small) to carry it through.

³Cabot, *loc. cit.*, p. 673.

the following year. The schools had not noticed at all when the vital features of the apprentice system dropped out. They continued along the old channel, their ancient methods aggravated by rapid growth in the number of students and by the lowering in the general level of their education and intelligence. Didactic lectures were given in huge, badly lighted amphitheaters, and in these discourses the instruction almost wholly consisted. Personal contact between teacher and student, between student and patient, was lost. No consistent effort was made to adapt medical training to changed circumstances. Many of the schools had no clinical facilities whatsoever, and the absence of adequate clinical facilities is to this day not prohibitive. The school session had indeed been lengthened to two sessions; but they were of only sixteen to twenty weeks each. Moreover, the course was not graded and the two classes were not separated. The student had two chances to hear one set of lectures—and for the privilege paid two sets of fees. To this traffic many of the ablest practitioners in the country were parties, and with little or no realization of its enormity at that! "It is safe to say," said Henry J. Bigelow, professor of surgery at Harvard in 1871, "that no successful school has thought proper to risk large existing classes and large receipts in attempting a more thorough education."¹ A minority successfully wrung a measure of good from the vicious system which they were powerless to destroy. They contrived to reach and to inspire the most capable of their hearers. The best products of the system are thus hard to reconcile with the system itself. Competent and humane physicians the country came to have,—at whose and at what cost, one shudders to reflect; for the early patients of the rapidly made doctors must have played an unduly large part in their practical training. An annual and increasing exodus to Europe also did much to repair the deficiencies of students who would not have neglected better opportunities at home. The Edinburgh and London tradition, maintained by John Bell, Abernethy, and Sir Astley Cooper, persisted well into the century. In the thirties, Paris became the medical student's Mecca, and the statistical and analytical study of disease, which is the discriminating mark of modern scientific medicine, was thence introduced into America by the pupils of Louis,²—the younger Jackson, "dead ere his prime," Gerhard, and their successors. With the generation succeeding the civil war, the tide turned decisively towards Germany, and thither continues to set. These men subsequently became teachers in the colleges at Philadelphia, New York, Boston, Charleston, and elsewhere; and from them the really capable and energetic students got much. One of the latter, who in recent years has wielded perhaps the greatest single influence in the country towards the reconstruction of medical education, says of his own school, the College of Physicians and Surgeons of New York, in the early seventies: "One can decry the system of those days, the inadequate preliminary requirements, the short courses, the dominance of the didactic lecture, the meager appliances for

¹ *Medical Education in America*, by Henry J. Bigelow, Cambridge, the University Press, 1871, p. 79.

² Osler: "Influence of Louis on Modern Medicine," *Bulletin Johns Hopkins Hospital*, vol. iii., nos. 77, 78.

demonstrative and practical instruction, but the results were better than the system. Our teachers were men of fine character, devoted to the duties of their chairs; they inspired us with enthusiasm, interest in our studies and hard work, and they imparted to us sound traditions of our profession; nor did they send us forth so utterly ignorant and unfitted for professional work as those born of the present greatly improved methods of training and opportunities for practical studies are sometimes wont to suppose. Clinical and demonstrative teaching for undergraduates already existed. Of laboratory training there was none."¹ As much could perhaps be said of a half-dozen other institutions. The century was therefore never without brilliant names in anatomy, medicine, and surgery; but they can hardly be cited in extenuation of conditions over which unusual gifts and perseverance alone could triumph. Those conditions made uniform and thorough teaching impossible; and they utterly forbade the conscientious elimination of the incompetent and the unfit.

From time to time, of course, the voice of protest was heard, but it was for years a voice crying in the wilderness. Delegates from medical schools and societies met at Northampton, Massachusetts, in 1827, and agreed upon certain recommendations lengthening the term of medical study and establishing a knowledge of Latin and natural philosophy as preliminary thereto. The Yale Medical School actually went so far as to procure legislation to this end. But it subsequently beat a retreat when it found itself isolated in its advanced position, its quondam allies having failed to march.² As far back as 1835, the Medical College of Georgia had vainly suggested concerted action looking to more decent methods; but no step was taken until, eleven years later, an agitation set up by Nathan Smith Davis resulted in the formation of the American Medical Association, committed to two propositions, *viz.*, that it is desirable "that young men received as students of medicine should have acquired a suitable preliminary education," and "that a uniform elevated standard of requirements for the degree of M.D. should be adopted by all the medical schools in the United States." This was in 1846; much water has flowed under the bridge since then; and though neither of these propositions has even yet been realized, there is no denying that, especially in the last fifteen years, substantial progress has been made.

In the first place, the course has now at length been generally graded³ and ex-

¹ Wm. H. Welch: "Development of American Medicine," *Columbia University Quarterly Supplement*, Dec., 1907.

² Wm. H. Welch: "The Relation of Yale to Medicine" (reprinted from *Yale Medical Journal* for Nov., 1901), p. 90, and note 28, pp. 30, 31.

³ A certain amount of ungraded teaching is still to be found, especially in the south and west. For example, at Chattanooga, no examinations are held at the close of the first year; the examinations at the close of the second year are supposed to cover two years' work, the practical outcome of which is obvious. More frequently, clinical lectures are delivered to the juniors and seniors together,—at least, as far as a single amphitheater is capable of containing the combined classes. This is the case at the University of Louisville. At certain other schools, the work is only partially graded, *e.g.*, the Memphis Hospital Medical College, Tennessee Medical College, University of Arkansas, Birmingham Medical College, Ensworth Medical College (St. Joseph, Mo.), Hahnemann, San Francisco, Kansas Medical (Topeka), Woman's Medical (Baltimore), Maryland Medical, Mississippi Medical, American

tended to four years, still varying, however, from six¹ to nine months each in duration. Didactic teaching has been much mitigated. Almost without exception the schools furnish some clinical teaching; many of them provide a fair amount, though it is still only rarely used to the best teaching advantage; a few are quite adequately equipped in this respect. Relatively quicker and greater progress has been made on the laboratory side since, in 1878,² Dr. Francis Delafield established the laboratory of the Alumni Association of the College of Physicians and Surgeons of New York;³ in the same autumn Dr. William H. Welch opened the pathological laboratory of the Bellevue Hospital Medical College, from which, six years later, he was called to organize the Johns Hopkins Medical School in Baltimore. It is at length everywhere conceded that the prospective student of medicine should prove his fitness for the undertaking. Not a few schools rest on a substantial admission basis; the others have not yet abandoned the impossible endeavor at one and the same time to pay their own way and to live up to standards whose reasonableness they cannot deny. Finally, the creation of state boards has compelled a greater degree of conscientiousness in teaching, though in many places, unfortunately, far too largely the conscientiousness of the drillmaster.

In consequence of the various changes thus briefly recounted, the number of medical schools has latterly declined. Within a twelvemonth a dozen have closed their doors. Many more are obviously gasping for breath. Practically without exception, the independent schools are scanning the horizon in search of an unoccupied university harbor. It has, in fact, become virtually impossible for a medical school to comply even in a perfunctory manner with statutory, not to say scientific, requirements and show a profit. The medical school that distributes a dividend to its professors or pays for buildings out of fees must cut far below the standards which its own catalogue probably alleges. Nothing has perhaps done more to complete the discredit of commercialism than the fact that it has ceased to pay. It is but a short step from an annual deficit to the conclusion that the whole thing is wrong anyway.

In the first place, however, the motive power towards better conditions came from genuine professional and scientific conviction. The credit for the actual initiative belongs fairly to the institutions that had the courage and the virtue to make the start. The first of these was the Chicago school, which is now the medical de-

Medical (St. Louis), St. Louis College of Physicians and Surgeons, Barnes Medical, Western Eclectic (Kansas City), Eclectic Medical (New York), Eclectic Institute (Cincinnati).

¹The low-grade southern schools have a nominal seven months' course; but as they allow students to enter without penalty several weeks later and have liberal Christmas holidays besides, the course is actually less than six months.

²Prior to this date Drs. Francis Delafield, E. G. Janeway, and others had given courses at Bellevue Hospital and elsewhere in histology, pathology, etc. See George C. Freeborn: *History of the Association of the Alumni of the College of Physicians and Surgeons*, New York, p. 10, etc. Instruction in pathological anatomy in the Harvard Medical School had begun in 1870 with the appointment of Dr. R. H. Fitz to an instructorship in that subject.

³This laboratory was at first independent of the faculty of the College of Physicians and Surgeons.

partment of Northwestern University, and which in 1859 initiated a three-year graded course. Early in the seventies the new president of Harvard College startled the bewildered faculty of its medical school into the first of a series of reforms that began with the grading of the existing course and ended in 1901 with the requirement of an academic degree for admission.¹ In the process, the university obtained the same sort of control over its medical department that it exercises elsewhere.² Towards this consummation President Eliot had aimed from the start; but he was destined to be anticipated by the establishment in 1893 of the Johns Hopkins Medical School on the basis of a bachelor's degree, from which, with quite unprecedented academic virtue, no single exception has ever been made.³ This was the first medical school in America of genuine university type, with something approaching adequate endowment, well equipped laboratories conducted by modern teachers, devoting themselves unreservedly to medical investigation and instruction, and with its own hospital, in which the training of physicians and the healing of the sick harmoniously combine to the infinite advantage of both. The influence of this new foundation can hardly be overstated. It has finally cleared up the problem of standards and ideals; and its graduates have gone forth in small bands to found new establishments or to reconstruct old ones. In the sixteen years that have since elapsed, fourteen more institutions have actually advanced to the basis of two or more years of college work; others have undertaken shortly to do so. Besides these, there are perhaps a dozen other more or less efficient schools whose entrance requirements hover hazily about high school graduation. In point of organization, the thirty-odd schools now supplying the distinctly better quality of medical training are not as yet all of university type. Thither they are unquestionably tending; for the moment, however, the very best and some of the very worst⁴ are alike known as university departments. Not a few so-called university medical departments are such in name only. They are practically independent enterprises, to which some university has good-naturedly lent its prestige. The College of Physicians and Surgeons of Chicago is the medical department of the University of Illinois, but the relation between them is purely contractual; the state university contributes nothing to its support. The Southwestern University of Texas possesses a medical department at Dallas, but the university is legally protected against all responsibility for its debts.⁵ These fictitious alignments retard

¹ See page 98.

² A vein of unmistakable uneasiness runs through Bigelow's address on *Medical Education in America*, previously referred to: "Most American medical colleges are virtually close corporations, . . . administered by their professors, who receive the students' fees, and upon whose tact and ability the success of these institutions depends. A university possesses over all its departments a legal jurisdiction; but it may be a question of expediency how far this shall be enforced" (p. 59).

³ See, however, p. 98.

⁴ e.g., University of Arkansas, Willamette University, Cotner University (Lincoln, Nebraska), Western University (London, Ontario), Epworth University, Fort Worth University, etc.

⁵ Other university departments of this nominal character are: medical department of the University of Arkansas (Little Rock); College of Physicians and Surgeons (Los Angeles), which is nominally the medical department of the University of Southern California; Denver and Gross College of

the readjustment of medical education through further reduction in the number of schools, because the institutions involved are enabled to live on hope for perhaps another decade or more. It is important that our universities realize that medical education is a serious and costly venture; and that they should reject or terminate all connection with a medical school unless prepared to foot its bills and to pitch its instruction on a university plane. In Canada conditions have never become so badly demoralized as in the United States. There the best features of English clinical teaching had never been wholly forgotten. Convalescence from a relatively mild over-indulgence in commercial medical schools set in earlier and is more nearly completed.

With the creation of the heterogeneous situation thus bequeathed to us, it is clear that consideration for the public good has had on the whole little to do; nor is it to be expected that this situation will very readily readjust itself in response to public need. A powerful and profitable vested interest tenaciously resists criticism from that point of view; not, of course, openly. It is too obvious that if the sick are to reap the full benefit of recent progress in medicine, a more uniformly arduous and expensive medical education is demanded. But it is speciously argued that improvements thus accomplished will do more harm than good: for whatever makes medical education more difficult and more costly will deplete the profession and thus deprive large numbers of all medical attention whatsoever, in order that a fortunate minority may get the best possible care. It is important to forestall the issue thus raised; otherwise it will crop out at every turn of the following discussion, in the effort to justify the existing situation and to break the force of constructive suggestion. It seems, therefore, necessary to refer briefly at this point to the statistical aspects of medical education in America, so far as they are immediately pertinent to the question of improvement and reform.

The problem is of course practical and not academic. Pending the homogeneous filling up of the whole country, inequalities must be tolerated. Man has been not inaptly differentiated as the animal with "the desire to take medicine."¹ When sick, he craves the comfort of the doctor,—any doctor rather than none at all, and in this he will not be denied. The question is, then, not merely to define the ideal training of the physician; it is just as much, at this particular juncture, to strike the solution that, economic and social factors being what they are, will distribute as widely as possible the best type of physician so distributable. Doubtless the chaos above characterized is in part accounted for by crude conditions that laughed at regular methods of procedure. But this stage of our national existence has gone by. What with widely ramifying railroad and trolley service, improving roads, automobiles, and

Medicine, which is nominally the medical department of the University of Denver; School of Medicine of the University of Georgia; Albany (New York) Medical College, which is nominally the medical department of Union University; medical department of Western University (London, Ont.), etc. For none of these alliances is there a valid reason; on the contrary, there is in every instance a good reason why the university concerned should break off the connection.

¹ Oslar: *Aequanimitas*, p. 131.

rural telephones, we have measurably attained some of the practical consequences of homogeneity. The experience of older countries is therefore suggestive, even if not altogether conclusive.

Professor Paulsen, describing in his book on the *German Universities* the increased importance of the medical profession, reports with some astonishment that "the number of physicians has increased with great rapidity so that now there is, in Germany, one doctor for every 2000 souls, and in the large cities one for every 1000."¹ What would the amazed philosopher have said had he known that in the entire United States there is already on the average one doctor for every 568 persons, that in our large cities there is frequently one doctor for every 400² or less, that many small towns with less than 200 inhabitants each have two or three physicians apiece!³

Over-production is stamped on the face of these facts; and if, in its despite, there are localities without a physician, it is clear that even long-continued over-production of cheaply made doctors cannot force distribution beyond a well marked point. In our towns health is as good and physicians probably as alert as in Prussia; there is, then, no reason to fear an unheeded call or a too tardy response, if urban communities support one doctor for every 2000 inhabitants. On that showing, the towns have now four or more doctors for every one that they actually require,—something worse than waste, for the superfluous doctor is usually a poor doctor. So enormous an overcrowding with low-grade material both relatively and absolutely decreases the number of well trained men who can count on the profession for a livelihood. According to Gresham's law, which, as has been shrewdly remarked, is as valid in education as in finance, the inferior medium tends to displace the superior. If then, by having in cities one doctor for every 2000 persons, we got four times as good a doctor as now when we provide one doctor for every 500 or less, the apothecaries would find time hanging somewhat more heavily on their hands. Clearly, low standards and poor training are not now needed in order to supply physicians to the towns.

¹ Thilly's translation, p. 400.

² New York, 1 : 460 ; Chicago, 1 : 580 ; Washington, 1 : 270 ; San Francisco, 1 : 370. These ratios are calculated on the basis of figures obtained from Polk's *Medical Register*, the *American Medical Directory*, and estimates prepared by the U. S. Census Bureau. The force of the figures as to the number of physicians cannot be broken by urging that many physicians no longer practise. Such have been carefully excluded by the compilers of the *American Medical Directory*. Figures used throughout this report were obtained from these sources.

³ Examples may be cited at random from every section of the country in proof of the fact that overcrowding is general, not merely local or exceptional, e.g.:

Ohio:	Killbuck	population	207	has	three	doctors
	Houston	"	227	"	"	"
Texas:	Wellington	"	87	"	five	"
	Whitt	"	278	"	four	"
	Whitney	"	706	"	six	"
Massachusetts:	Colerain	"	80	"	two	"
	Harding	"	100	"	"	"
Nebraska:	Eustin	"	222	"	"	"
	Crofton	"	46	"	"	"
Oregon:	Fossil	"	270	"	"	"
	Gaston	"	122	"	"	"

(From the *American Medical Directory*. 1900.)

In the country the situation follows one of two types. Assuming that a thousand people in an accessible area will support a competent physician, one of two things will happen if the district contains many less. In a growing country, like Canada or our own middle west, the young graduate will not hesitate to pitch his tent in a sparsely settled neighborhood, if it promises a future. A high-grade and comparatively expensive education will not alter his inclination to do this. The more exacting Canadian laws rouse no objection on this score. The graduates of McGill and Toronto have passed through a scientific and clinical discipline of high quality; but one finds them every year draining off into the freshly opened Northwest Territory. In truth, it is an old story. McDowell left the Kentucky backwoods to spend two years under Bell in Edinburgh; and when they were over, returned contentedly to the wilderness, where he originated the operation for ovarian tumor in the course of a surgical practice that carried him back and forth through Kentucky, Ohio, and Tennessee. Benjamin Dudley, son of a poor Baptist preacher, dissatisfied with the results first of his apprenticeship, then of his Philadelphia training, hoarded his first fees, and with them subsequently embarked temporarily in trade; he loaded a flat-boat with sundries, which he disposed of to good advantage at New Orleans, there investing in a cargo of flour, which he sold to the hungry soldiers of Wellington in the Spanish peninsula. The profits kept Dudley in the hospitals of Paris for four years, after which he came back to Lexington, and for a generation was the great surgeon and teacher of surgery in the rough country across the Alleghanies. The pioneer is not yet dead within us. The self-supporting students of Ann Arbor and Toronto prove this. For a region which holds out hope, there is no need to make poor doctors,—still less to make too many of them.

In the case of stranded small groups in an unpromising environment the thing works out differently. A century of reckless over-production of cheap doctors has resulted in general overcrowding; but it has not forced doctors into these hopeless spots. It has simply huddled them thickly at points on the extreme margin. Certain rural communities of New England may, for example, have no physician in their midst, though they are in most instances not inaccessible to one. But let never so many low-grade doctors be turned out, whether in Boston or in smaller places like Burlington or Brunswick, that are supposed not to spoil the young man for a country practice, these unpromising places, destined perhaps to disappear from the map, will not attract them. They prefer competition in some already over-occupied field. Thus, in Vermont, Burlington, the seat of the medical department of the University of Vermont, with a population of less than 21,000, has 60 physicians, one for every 383 inhabitants;¹ nor can these figures be explained away on the ground that the largest city in the state is a vortex which absorbs more than its proper share; for the state abounds in small towns in which several doctors compete in the service of less than a thousand persons: Post Mills, with 105 inhabitants, has two doctors;

¹ *American Medical Directory*; Polk (1906) gives 75 active physicians, a ratio of 1:280.

Jeffersonville, with 400, has two; Plainfield, with 341, has three. Other New England states are in the same case. It would appear, then, that over-production on a low basis does not effectually overcome the social or economic obstacles to spontaneous dispersion. Perhaps the salvation of these districts might, under existing circumstances, be better worked out by a different method. A large area would support one good man, where its separate fragments are each unable to support even one poor man. A physician's range, actual and virtual, increases with his competency. A well qualified doctor may perhaps at a central point set up a small hospital, where the seriously ill of the entire district may receive good care. The region is thus better served by one well trained man than it could possibly be even if over-production on a low basis ultimately succeeded in forcing an incompetent into every hamlet of five and twenty souls. This it cannot compel. It cannot keep even the cheap man in a place without a "chance;" it can only demoralize the smaller places which are capable of supporting a better trained man whose energies may also reach out into the more thinly settled surrounding country. As a last resort, it might conceivably become the duty of the several states to salary district physicians in thinly settled or remote regions, — surely a sounder policy than the demoralization of the entire profession for the purpose of enticing ill trained men where they will not go.¹ We may safely conclude that our methods of carrying on medical education have resulted in enormous over-production at a low level, and that, whatever the justification in the past, the present situation in town and country alike can be more effectively met by a reduced output of well trained men than by further inflation with an inferior product.

The improvement of medical education cannot therefore be resisted on the ground that it will destroy schools and restrict output: that is precisely what is needed. The illustrations already given in support of this position may be reinforced by further examples from every section of the Union,—from Pennsylvania with one doctor for every 686 inhabitants, Maryland with one for every 658, Nebraska with one for every 602, Colorado with one for every 328, Oregon with one for every 646. It is frequently urged that, however applicable to other sections, this argument does not for the present touch the south, where continued tolerance of commercial methods is required by local conditions. Let us briefly consider the point. The section as a whole contains one doctor for every 760 persons. In the year 1908, twelve states² showed a gain in population of 358,837. If now we allow in cities one additional physician for every increase of 2000, and outside cities an additional one for every increase of 1000 in population,—an ample allowance in any event,—we may in general figure on one more physician for every gain of 1500 in total population. We are not now arguing that a ratio of 1:1500 is correct; we are under no necessity of proving that. Our conten-

¹ These officials would combine the duties of county health officer with those now assigned in large towns to the city physician.

² This includes Kentucky, Virginia, Tennessee, North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, Texas, Arkansas.

tion is simply that, starting with our present overcrowded condition, production henceforth at the ratio of one physician to every *increase* of 1500 in population will prevent a shortage, for the next generation at least. In 1908 the south, then, needed 240 more doctors to take care of its increase in population. In the course of the same year, it is estimated that 500 vacancies in the profession were due to death.¹ If every vacancy thus arising must be filled, conditions will never improve. Let us agree to work towards a more normal adjustment by filling two vacancies due to death with one new physician,—once more, a decidedly liberal provision. This will prove sufficiently deliberate; it would have called for 250 more doctors by the close of the year. In all, 490 new men would have amply cared for the increase in population and the vacancies due to death. As a matter of fact, the southern medical schools turned out in that year 1144 doctors; 78 more southerners were graduated from the schools of Baltimore and Philadelphia. The grand total would probably reach 1800,—1800 southern doctors to compete in a field in which one-third of the number would find the making of a decent living already difficult. Clearly, the south has no cause to be apprehensive in consequence of a reduced output of higher quality.² Its requirements in the matter of a fresh supply are not such as to make it necessary to pitch their training excessively low.

The rest of the country may be rapidly surveyed from the same point of view. The total gain in population, outside the southern states already considered, was 975,008,—requiring on the basis of one more doctor for every 1500 more people, 650 doctors. By death, in the course of the year there were in the same area 1730 vacancies. Replacing two vacancies by one doctor, 865 men would have been required; in most sections public interest would be better cared for if they all remained unfilled for a decade to come. On the most liberal calculation, 1500 graduates would be called for, and 1000 would be better still. There were actually produced in that year, outside the south, 8497, *i.e.*, between two and three times as many as the country could possibly assimilate; and this goes on, and has been going on, every year.

It appears, then, that the country needs fewer and better doctors; and that the way to get them better is to produce fewer. To support all or most present schools at the higher level would be wasteful, even if it were not impracticable; for they can-

¹ Based on figures collected by the American Medical Association.

² As Kentucky is one of the largest producers of low-grade doctors in the entire Union, it is interesting to observe conditions there. The following is the result of a careful study of Henderson County made for me by one thoroughly acquainted with it.

Total population, 36,000; number of doctors, 56; ratio, 1:624.

DISTRIBUTION							
Place	Population	No. Drs.	Ratio	Place	Population	No. Drs.	Ratio
City of Henderson	17,500	27	1:644	Zion	250	3	1:84
Anthaston	24	1	1:24	Robards	500	3	1:167
Baskett	200	2	1:100	Niagara	100	3	1:34
Cairo	200	1	1:200	McDonald's Landing	25		
Corydon	1,000	4	1:250	Alsey	25	1	1:25
Dixie	200	1	1:200	Smith Mills	200	3	1:67
Geneva	100	2	1:50	Spottsville	700	3	1:234
Hobardsville	400	2	1:200				

Throughout the county there are doctors within five miles everywhere.

not be manned. Some day, doubtless, posterity may reestablish a school in some place where a struggling enterprise ought now to be discontinued. Towards that remote contingency nothing will, however, be gained by prolonging the life of the existent institution.

The statistics just given have never been compiled or studied by the average medical educator. His stout asseveration that "the country needs more doctors" is based on "the letters on file in the dean's office," or on some hazy notion respecting conditions in neighboring states. As to the begging letters: selecting a thinly settled region, I obtained from the dean of the medical department of the University of Minnesota a list of the localities whence requests for a physician have recently come. With few exceptions, they represent five states:¹ fifty-nine towns in Minnesota want a doctor; but investigation shows that these fifty-nine towns have already one hundred and forty-nine doctors between them!² Forty-one places in North Dakota apply; they have already one hundred and twenty-one doctors. Twenty-one applications come from South Dakota, from towns having already forty-nine doctors; seven from Wisconsin, from places that had twenty-one physicians before their prayer for more was made; six from Iowa, from towns that had seventeen doctors at the time. It is clear that the files of the deans will not invalidate the conclusion which a study of the figures suggests. They are more apt to sustain it: for the requests in question are less likely to mean "no doctor" than poor doctors,³—a distemper which continued over-production on the same basis can only aggravate, and which a change to another of the same type will not cure. As to general conditions, no case has been found in which a single medical educator contended that his own vicinity or state is in need of more doctors: it is always the "next neighbor." Thus the District of Columbia, with one doctor for every two hundred and sixty-two souls, maintains two low-grade medical schools. "Do you need more doctors in the District?" was asked of one of the deans. "Oh, no, we are making doctors for Maryland, Virginia, and Pennsylvania,"—for Maryland, with seven medical schools of its own and one doctor for every six hundred and fifty-eight inhabitants; for Virginia, with three medical schools of its own and one doctor for every nine hundred and eighteen; for Pennsylvania, with its eight schools and one doctor for every six hundred and thirty-six persons.

With the over-production thus demonstrated, the commercial treatment of medical education is intimately connected. Low standards give the medical schools access to a large clientele open to successful exploitation by commercial methods. The

¹ The general distribution in these states shows that over-production prevails in new states as in old ones: Minnesota 1: 981; South Dakota 1: 821; Iowa 1: 605; North Dakota 1: 971; Wisconsin 1: 936.

² Ten of the fifty-nine were without registered physicians; but of these ten, two are not to be found on the map, two more are not in the *Postal Guide*; of the other six, four are in easy reach of doctors; two, with a combined population of one hundred and fifty, are out of reach.

³ Occasionally these applications, which create the impression of a dearth, come from apothecaries who have a rear office to rent, a physician with a practice to sell, etc.

crude boy or the jaded clerk who goes into medicine at this level has not been moved by a significant prompting from within; nor has he as a rule shown any forethought in the matter of making himself ready. He is more likely to have been caught drifting at a vacant moment by an alluring advertisement or announcement, quite commonly an exaggeration, not infrequently an outright misrepresentation. Indeed, the advertising methods of the commercially successful schools are amazing.¹ Not infrequently advertising costs more than laboratories. The school catalogues abound in exaggeration, misstatement, and half-truths.² The deans of these institutions occasionally know more about modern advertising than about modern medical teaching. They may be uncertain about the relation of the clinical laboratory to bedside instruction; but they have calculated to a nicety which "medium" brings the largest "return." Their dispensary records may be in hopeless disorder; but the card system by which they keep track of possible students is admirable. Such exploitation of medical education, confined to schools that admit students below the level of actual high school graduation, is strangely inconsistent with the social aspects of medical practice. The overwhelming importance of preventive medicine, sanitation, and public health indicates that in modern life the medical profession is an organ differentiated by society for its own highest purposes, not a business to be exploited by individuals according to their own fancy. There would be no vigorous campaigns led by enlightened practitioners against tuberculosis, malaria, and diphtheria, if the commercial point of view were tolerable in practice. And if not in practice, then not in education. The theory of state regulation covers that point. In the act of granting the right to confer degrees, the state vouches for them; through protective boards it still further seeks to safeguard the people. The public interest is then paramount, and when public interest, professional ideals, and sound educational procedure concur in the recommendation of the same policy, the time is surely ripe for decisive action. ✓

¹ One school offers any graduate who shall have been in attendance three years a European trip.

² See chapter viii., "Financial Aspects of Medical Education," especially p. 135.

³ A few instances may be cited at random:

Medical Department, University of Buffalo: "The dispensary is conducted in a manner unlike that usually seen. . . . Each one will secure unusually thorough training in taking and recording of histories" (p. 25). There are no dispensary records worthy the name.

Halifax Medical College: "First-class laboratory accommodation is provided for histology, bacteriology and practical pathology" (p. 9). One utterly wretched room is provided for all three.

Medical Department, University of Illinois: "The University Hospital . . . contains one hundred beds, and its clinical advantages are used exclusively for the students of this college" (p. 56). Over half of these beds are private, and the rest are of but limited use.

Western University (London, Ontario): Clinical instruction. "The Victoria Hospital . . . now contains two hundred and fifty beds, and is the official hospital of the City of London," etc. (p. 14). On the average, less than thirty of these beds are available for teaching.

The Medical Department of the University of Chittanooga: "The latest advances" are taught "in the most entertaining and instructive manner;" professors are "chosen for their proficiency;" "speculative research pertains" to the department of physiology; the department of pathology is "provided with a costly collection of specimens and generous supply of the best microscopes" (one, as a matter of fact); "the hospitals afford numerous cases of labor"!

CHAPTER II

THE PROPER BASIS OF MEDICAL EDUCATION

WE have in the preceding chapter briefly indicated three stages in the development of medical education in America,—the preceptorship, the didactic school, the scientific discipline. We have seen how an empirical training of varying excellence, secured through attendance on a preceptor, gave way to the didactic method, which simply communicated a set body of doctrines of very uneven value; how in our own day this didactic school has capitulated to a procedure that seeks, as far as may be, to escape empiricism in order to base the practice of medicine on observed facts of the same order and cogency as pass muster in other fields of pure and applied science. The apprentice saw disease; the didactic pupil heard and read about it; now once more the medical student returns to the patient, whom in the main he left when he parted with his preceptor. But he returns, relying no longer altogether on the senses with which nature endowed him, but with those senses made infinitely more acute, more accurate, and more helpful by the processes and the instruments which the last half-century's progress has placed at his disposal. This is the meaning of the altered aspect of medical training: the old preceptor, be he never so able, could at best feel, see, smell, listen, with his unaided senses. His achievements are not indeed to be lightly dismissed; for his sole reliance upon his senses greatly augmented their power. Succeed as he might, however, his possibilities in the way of reducing, differentiating, and interpreting phenomena, or significant aspects of phenomena, were abruptly limited by his natural powers. These powers are nowadays easily enough transcended. The self-registering thermometer, the stethoscope, the microscope, the correlation of observed symptoms with the outgivings of chemical analysis and biological experimentation, enormously extend the physician's range. He perceives more speedily and more accurately what he is actually dealing with; he knows with far greater assurance the merits or the limitations of the agents which he is in position to invoke. Though the field of knowledge and certainty is even yet far from coextensive with the field of disease and injury, it is, as far as it goes, open to quick, intelligent, and effective action.

Provided, of course, the physician is himself competent to use the instrumentalities that have been developed! There is just now the rub. Society reaps at this moment but a small fraction of the advantage which current knowledge has the power to confer. That sick man is relatively rare for whom actually all is done that is at this day humanly feasible,—as feasible in the small hamlet as in the large city, in the public hospital as in the private sanatorium. We have indeed in America medical practitioners not inferior to the best elsewhere; but there is probably no other country in the world in which there is so great a distance and so fatal a difference between the best, the average, and the worst.

The attempt will be made in this chapter and the next to account for these discrepancies in so far as they are traceable to circumstances that antedate the formal beginning of medical education itself. The mastery of the resources of the profession in the modern sense is conditioned upon certain definite assumptions, touching the medical student's education and intelligence. Under the apprentice system, it was not necessary to establish any such general or uniform basis. The single student was in personal contact with his preceptor. If he were young or immature, the preceptor could wait upon his development, initiating him in simple matters as they arose, postponing more difficult ones to a more propitious season; meanwhile, there were always the horses to be curried and the saddle-bags to be replenished. In the end, if the boy proved incorrigibly dull, the preceptor might ignore him till a convenient excuse discontinued the relation. During the ascendancy of the didactic school, it was indeed essential to good results that lecturers and quizmasters should be able to gauge the general level of their huge classes; but this level might well be low, and in the common absence of conscientiousness usually fell far below the allowable minimum. In any event, the student's part was, parrot-like, to absorb. His medical education consisted largely in getting by heart a prearranged system of correspondences,—an array of symptoms so set off against a parallel array of doses that, if he noticed the one, he had only to write down the other: a coated tongue—a course of calomel; a shivery back—a round of quinine. What the student did not readily apprehend could be drilled¹ into him—towards examination time—by those who had themselves recently passed through the ordeal which he was now approaching; and an efficient apparatus that spared his senses and his intellect as entirely as the drillmaster spared his industry was readily accessible at temptingly low prices in the shape of "essentials" and "quiz-compenda." Thus he got, and in places still gets, his *materia medica*, anatomy, obstetrics, and surgery. The medical schools accepted the situation with so little reluctance that these compends were—and occasionally still are—written by the professors² and sold on the pre-

¹ "A reiteration of undisputed facts in their simplest expression," is Bigelow's way of putting it. *Loc. cit.*, p. 11.

² From the last catalogues of certain medical publishers:

"QUIZ-COMPENDS:"

Physiology, by A. P. Brubaker, Professor of Physiology, Jefferson Medical College, Philadelphia.

Gynecology, by Wm. H. Wells, Demonstrator of Clinical Obstetrics, Jefferson Medical College, Philadelphia.

Surgery, by Orville Horwitz, Prof. of Genito-Urinary Surgery, Jefferson Medical College, Philadelphia.

Diseases of Children, by Marcus P. Hatfield, Professor of Diseases of Children, Chicago Medical College.

Special Pathology, by A. E. Thayer, Professor of Pathology, University of Texas.

"ESSENTIALS:"

Surgery, by Edward Martin, Professor of Clinical Surgery, University of Pennsylvania.

Anatomy, by C. B. Nancrede, Professor of Surgery, University of Michigan.

Obstetrics, by W. E. Ashton, Professor of Gynecology, Medico-Chirurgical College, Philadelphia.

Gynecology, by E. B. Cragin, Professor of Obstetrics, Columbia University.

Histology, by Louis Leroy, Professor of Medicine, College of Physicians and Surgeons, Memphis.

Diseases of the Skin, by H. W. Stelwagon, Prof. of Dermatology, Jefferson Medical College, Phila.

Diseases of the Eye, by Edward Jackson, Professor of Ophthalmology, University of Colorado.

mises.¹ Under such a régime anybody could, as President Eliot remarked, "walk into a medical school from the street," and small wonder that of those who did walk in, many "could barely read and write."² But with the advent of the laboratory, in which every student possesses a locker where his individual microscope, reagents, and other paraphernalia are stored for his personal use; with the advent of the small group bedside clinic, in which every student is responsible for a patient's history and for a trial diagnosis, suggested, confirmed, or modified by his own microscopical and chemical examination of blood, urine, sputum, and other tissues, the privileges of the medical school can no longer be open to casual strollers from the highway. It is necessary to install a doorkeeper who will, by critical scrutiny, ascertain the fitness of the applicant: a necessity suggested in the first place by consideration for the candidate, whose time and talents will serve him better in some other vocation, if he be unfit for this; and in the second, by consideration for a public entitled to protection from those whom the very boldness of modern medical strategy equips with instruments that, tremendously effective for good when rightly used, are all the more terrible for harm if ignorantly or incompetently employed.

A distinct issue is here presented. A medical school may, the law permitting, eschew clinics and laboratories, cling to the didactic type of instruction, and arrange its dates so as not to conflict with seedtime and harvest; or it may equip laboratories, develop a dispensary, and annex a hospital, pitching its entrance requirements on a basis in keeping with its opportunities and pretensions. But it cannot consistently open the latter type of school to the former type of student. It cannot provide laboratory and bedside instruction on the one hand, and admit crude, untrained boys on the other. The combination is at once illogical and futile. The funds of the school may indeed procure facilities; but the intelligence of the students can alone ensure their proper use. Nor can the dilemma be evaded by alleging that a small amount of laboratory instruction administered to an unprepared medical student makes a "practitioner," while the more thorough training of a competent man makes a "scientist."³ At the level at which under the most favorable circumstances the medical student gets his education, it is absurd to speak of an inherent conflict between science and practice. We shall have occasion later to touch on the relation of teaching and

¹For example, in the Atlanta College of Physicians and Surgeons; Medical Department, University of Nashville; North Carolina Medical College (Charlotte); Medical Department, University of Pittsburgh; John A. Creighton Medical College (Omaha, Nebraska); Starling-Ohio Medical College (Columbus); George Washington University (D. C.).

²The *American Medical Association Bulletin*, vol. iii, no. 5, p. 262.

³At a medical convention recently held, a professor in an institution on the basis of a "high school education or its equivalent," made this point in a speech, as against the medical department of a university, which requires for entrance college work: The lower-grade institution made "doctors," it was averred; the higher made only "scientists." Now it chanced that for the last two years both sets of students have submitted to a practical examination in subjects like urinalysis, which assuredly it behooves the "doctor" as well as the "scientist" to master. At these examinations the "doctors" show an average of 59 per cent; the "scientists," 77 per cent. On the combined written and practical examinations this year, the "doctors" in question averaged 65.2 per cent, the "scientists" averaged 83.1 per cent.

research,¹ between which it is necessary to establish a *modus vivendi*. But that problem has nothing to do with the point now under discussion,—viz., as to how much education or intelligence it requires to establish a reasonable presumption of fitness to undertake the study of medicine under present conditions. ✓

Taking, then, modern medicine as an attempt to fight the battle against disease most advantageously to the patient, what shall we require of those who propose to enlist in the service? To get a somewhat surer perspective in dealing with a question around which huge clouds of dust have been beaten up, let us for a moment look elsewhere. A college education is not in these days a very severe or serious discipline. It is compounded in varying proportions of work and play; it scatters whatever effort it requires, so that at no point need the student stand the strain of prolonged intensive exertion. Further, the relation of college education to specific professional or vocational competency is still under dispute. It is clear, then, that a college education is less difficult, less trying, less responsible, than a professional education in medicine. It is therefore worth remarking that the lowest terms upon which a college education is now regularly accessible are an actual four-year high school training, scholastically determined, whether by examination of the candidate or by appraisalment of the school. ✓

Technical schools of engineering and the mechanic arts afford perhaps an even more illuminating comparison. These institutions began, like the college, at a low level; but they did not long rest there. Their instruction was too heavily handicapped by ignorance and immaturity. To their graduates, tasks involving human life and welfare were committed: the building of bridges, the installation of power plants, the construction of sewage systems. The technical school was thus driven to seek students of greater maturity, of more thorough preliminary schooling, and strictly to confine its opportunities to them. Now it is noteworthy that, though in point of intensive strain the discipline of the modern engineer equals the discipline of the modern physician, in one important respect, at least, it is less complex and exacting. ✓ The engineer deals mainly with measurable factors. His factor of uncertainty is within fairly narrow limits. The reasoning of the medical student is much more complicated. He handles at one and the same time elements belonging to vastly different categories: physical, biological, psychological elements are involved in each other. Moreover, the recent graduate in engineering is not at once exposed to a decisive responsibility; to that he rises slowly through a lengthy series of subordinate positions that search out and complete his education.² Between the young graduate in medicine and his ultimate responsibility—human life—nothing interposes. He cannot nowadays begin with easy tasks under the surveillance of a superior; the issues of life

¹ See page 55.

² It is interesting to observe the tendency towards conferring only a bachelor's degree in engineering at graduation instead of the degree of C.E., etc. The bachelor in engineering usually goes to work at laborer's wages; he is years reaching the degree of responsibility with which the graduate in medicine usually begins.

and death are all in the day's work for him from the very first. The training of the doctor is therefore more complex and more directly momentous than that of the technician. Be it noted, then, that the minimum basis upon which a good school of engineering to-day accepts students is, once more, an actual high school education, and that the movement towards elongating the technical course to five years confesses the urgent need of something more.

There is another aspect of the problem equally significant. The curriculum of the up-to-date technical school is heavily weighted, to be sure; but except for mathematics, the essential subjects with which it starts are separate sciences that presuppose no prior mastery of contributory sciences. Take at random the College of Engineering of the University of Wisconsin. In the first year the science work is chemistry, and though the course is difficult, it demands no preceding acquaintance with chemistry itself or with any other science; second-year physics is in the same case, and the mechanics of the second semester looks back no further than to the physics of the first.

Very different is the plight of the medical school. There the earliest topics of the curriculum proper—*anatomy, physiology, physiological chemistry*—already hark back to a previous scientific discipline. Every one of them involves already acquired knowledge and manipulative skill. They are laboratory sciences at the second, not the primary, stage. Consider, for example, *anatomy*, the simplest and most fundamental of them all. It used to begin and end with the dissection of the adult cadaver. It can neither begin nor end there to-day; for it must provide the basis upon which experimental physiology, pathology, and bacteriology may intelligently be built up. Mere dissection does not accomplish this; in addition to gross anatomy, the student must make out under the microscope the normal cellular structure of organ, muscle, nerve, and blood-vessel; he must grasp the whole process of structural development. Histology and embryology are thus essential aspects of anatomical study. No treatment of the subject including these is possible within the time-limits of the modern medical curriculum unless previous training in general biology has equipped the student with the necessary fundamental conceptions, knowledge, and technical dexterity. It has just been stated that physiology presupposes anatomy on lines involving antecedent training in biology; it leans just as hard on chemistry and physics. The functional activities of the body propound questions in applied chemistry and applied physics. Nutrition and waste—what are these but chemical problems within the realm of biology? The mechanism of circulation, of seeing, or hearing—what are these but physical problems under the same qualifications? The normal rhythm of physiological function must then remain a riddle to students who cannot think and speak in biological, chemical, and physical language.

All this is, however, only preliminary. The physician's concern with normal process is not disinterested curiosity; it is the starting-point of his effort to comprehend and to master the abnormal. Pathology and bacteriology are the sciences concerned

with abnormalities of structure and function and their causation. Now the agents and forces which invade the body to its disadvantage play their game, too, according to law. And to learn that law one goes once more to the same fundamental sciences upon which the anatomist and the physiologist have already freely drawn,—*viz.*, biology, physics, and chemistry.

Nor do these apparently recondite matters concern only the experimenting investigator, eager to convert patiently acquired knowledge of bacterial and other foes into a rational system of defense against them. For the practical outcome of such investigation is not communicable by rote; it cannot be reduced to prescriptions for mechanical use by the unenlightened practitioner. Modern medicine cannot be formulated in quiz-compendes; those who would employ it must trouble to understand it. Moreover, medicine is developing with beneficent rapidity along these same biological and chemical lines. Is our fresh young graduate of five and twenty to keep abreast of its progress? If so, he must, once more, understand; not otherwise can he adopt the new agents and new methods issuing at intervals from each of a dozen fertile laboratories; for rote has no future: it stops where it is. "There can be no doubt," said Huxley, "that the future of pathology and of therapeutics, and *therefore of practical medicine*, depends upon the extent to which those who occupy themselves with these subjects are trained in the methods and impregnated with the fundamental truths of biology."¹ Now the medical sciences proper—*anatomy, physiology, pathology, pharmacology*—already crowd the two years of the curriculum that can be assigned to them; and in so doing, take for granted the more fundamental sciences—*biology, physics, and chemistry*—for which there is thus no adequate opportunity within the medical school proper. Only at the sacrifice of some essential part of the medical curriculum—and for every such sacrifice the future patients pay—can this curriculum be made to include the preliminary subjects upon which it presumes.

From the foregoing discussion, these conclusions emerge: By the very nature of the case, admission to a really modern medical school must at the very least depend on a competent knowledge of chemistry, biology,² and physics. Every departure from this basis is at the expense of medical training itself. From the exclusive standpoint of the medical school it is immaterial where the student gets the instruction. But it is clear that if it is to become the common minimum basis of medical education, some recognized and organized manner of obtaining it must be devised: it cannot be left to the initiative of the individual without greatly impairing its quality. Regular provision must therefore be made at a definite moment of normal educational progress. Now the requirement above agreed on is too extensive and too difficult to be incorporated in its entirety within the high school or to be substituted for a considerable

¹ Quoted by F. T. Lewis in "The Preparation for the Study of Medicine," *Popular Science Monthly*, vol. lxxv., no. 1, p. 66.

² Including botany.

portion of the usual high school course; besides, it demands greater maturity than the secondary school student can be credited with except towards the close of his high school career. The possibility of mastering the three sciences outside of school may be dismissed without argument. In the college or technical school alone can the work be regularly, efficiently, and surely arranged for. The requirement is therefore necessarily a college requirement, covering two years, because three laboratory courses cannot be carried through in a briefer period,—a fortunate circumstance, since it favors the student's simultaneous development along other and more general lines. It appears, then, that a policy that at the outset was considered from the narrow standpoint of the medical school alone shortly involves the abandonment of this point of view in favor of something more comprehensive. The preliminary requirement for entrance upon medical education must therefore be formulated in terms that establish a distinct relation, pedagogical and chronological, between the medical school and other educational agencies. Nothing will do more to steady and to improve the college itself than its assumption of such definite functions in respect to professional and other forms of special training.

So far we have spoken explicitly of the fundamental sciences only. They furnish, indeed, the essential instrumental basis of medical education. But the instrumental minimum can hardly serve as the permanent professional minimum. It is even instrumentally inadequate. The practitioner deals with facts of two categories. Chemistry, physics, biology enable him to apprehend one set; he needs a different apperceptive and appreciative apparatus to deal with other, more subtle elements. Specific preparation is in this direction much more difficult; one must rely for the requisite insight and sympathy on a varied and enlarging cultural experience. Such enlargement of the physician's horizon is otherwise important, for scientific progress has greatly modified his ethical responsibility. His relation was formerly to his patient—at most to his patient's family; and it was almost altogether remedial. The patient had something the matter with him; the doctor was called in to cure it. Payment of a fee ended the transaction. But the physician's function is fast becoming social and preventive, rather than individual and curative. Upon him society relies to ascertain, and through measures essentially educational to enforce, the conditions that prevent disease and make positively for physical and moral well-being. It goes without saying that this type of doctor is first of all an educated man.

How nearly our present resources—educational and economic—permit us to approach the standards above defined is at bottom a question of fact to be investigated presently. We have concluded that a two-year college training, in which the sciences are "featured," is the minimum basis upon which modern medicine can be successfully taught. If the requisite number of physicians cannot at one point or another be procured at that level, a temporary readjustment may be required; but such an expedient is to be regarded as a makeshift that asks of the sick a sacrifice that must not be required of them a moment longer than is necessary. Before accepting such

a measure, however, it is exceedingly important not to confuse the basis on which society can actually get the number of doctors that it needs with the basis on which our present number of medical schools can keep going. Much depends upon which end we start from.

CHAPTER III

THE ACTUAL BASIS OF MEDICAL EDUCATION

TAKING a two-year college course, largely constituted of the sciences, as the normal point of departure, let us now survey the existing status. The one hundred and fifty-five medical schools of the United States and Canada fall readily into three divisions: the first includes those that require two or more years of college work for entrance; the second, those that demand actual graduation from a four-year high school or oscillate about its supposed "equivalent;" the third, those that ask little or nothing more than the rudiments or the recollection of a common school education.

To the first division sixteen institutions already belong;¹ six more, now demanding one year of college work, will fully enter the division in the fall of 1910 by requiring a second;² and several more, at this date still in the second division, will shortly take the step from the high school to the two-year college requirement.³ The Johns Hopkins requires for entrance a college degree which, whatever else it represents, must include the three fundamental sciences, French, and German. No exception has ever been made to this degree requirement; but recently admission to the second-year class has been granted to students holding an A.B. degree earned by four years' study, the last of them devoted to medical subjects in institutions where those subjects were excellently taught.⁴ At Harvard the degree requirement has been somewhat unsettled by a recent decision to admit students without degree, provided they have had two years of college science; they are to be grouped as "spe-

¹ Johns Hopkins, Harvard, Western Reserve, Rush (University of Chicago), Cornell, Stanford, Wake Forest (N. C.), Yale, and the state universities of California, Minnesota, North Dakota, Wisconsin, Michigan (exclusive of the homeopathic department), Kansas, Nebraska, South Dakota.

² Universities of Indiana, Iowa (exclusive of the homeopathic department), Missouri, Pennsylvania, Utah, Syracuse. Several institutions ask one year of college work, without as yet definite announcement as to requirement of the second, *e.g.*, Virginia, Fordham, Northwestern, North Carolina. In general, the one-year college requirement is hard to distinguish from the high school requirement, for if conditions are allowed, — and they always are, — it adds but little to the better type of high school education. Northwestern has had two years' experience under the one-year college requirement, but has not yet really enforced it. The University of North Carolina was to require a year of college work, 1909-10, but students were admitted on the strength of their unsupported statements "as having had a college year. . . . Practically, this means that the entrance requirements were not enforced."

³ Columbia, Dartmouth, Colorado.

⁴ Practically, this amounts to a recognition of the A.B. degree won after three years of study, — a movement deserving encouragement rather than criticism, as matters now stand. In fact, the Johns Hopkins degree was originally conferred at the close of three years of study, but the academic matriculation requirement was considerably higher than in institutions granting the A.B. degree after four years of study. Recently the academic matriculation has been lowered and the A.B. course lengthened to four years. In consequence, the action of the medical department above described involves unwittingly a curious discrimination against the Johns Hopkins A.B. degree, for this degree now requires four years and may not include medical subjects. To get the Johns Hopkins M.D., a student has two roads open to him: he may work four years for the Johns Hopkins A.B. and four more for its M.D., — eight in all; or, starting at exactly the same point, he may get his A.B. in four years at an institution that includes in its A.B. the first year in medicine, then enter the Johns Hopkins medical school and get its M.D. in three years, — that is, seven years in all. A B.S. degree earned in three years, followed by the M.D. earned in four, gives the same result, — a preference, once more, that operates against the Johns Hopkins A.B.

cial" students, and are required to maintain higher standing in order to qualify for the M.D. degree. But as these students enter on a general rule and as a matter of course, and are, under a slight handicap, eligible to the M.D. degree, they are not accurately described as special. A special student is properly one whom no rule fits, one whose admission presents certain individual features requiring consideration on their merits. Such is not the case with the students under discussion: they enter just as regularly as the degree men, and without that limitation as to number which makes of the "special student" device something of a privilege. Harvard can thus admit any student who is eligible to the schools with the two-year college requirement.¹ The other institutions under discussion telescope the college and medical courses: the preliminary medical sciences constitute the bulk of two college years;² the next two years are reckoned twice. They count simultaneously as third and fourth years of the college and as first and second years of the medical course. At their close the student gets the A.B. degree, but his medical education is already half over. Without exception, the schools belonging to this group are high-grade institutions. They differ considerably, however, in the degree of rigor with which their elevated entrance requirements have been enforced from the start. At the University of Pennsylvania, for example, in a class of 114, admitted this year (1909-10) on a one-year college basis, 75 (66 per cent) are conditioned; at Ann Arbor, of 36 entering on the two-year college basis, only 8 are conditioned at all, and those mainly in organic chemistry; at Yale, which advanced in 1909-10 from the high school to the two-year college basis, in a class of 23, there was only one partial condition in biology, and, best of all, failed members of last year's class on the old basis were refused re-admission. Experience elsewhere indicates that the percentage of conditions declines rapidly as students learn by forethought to adjust their work to their ultimate purpose, and as the colleges facilitate adjustment by providing the requisite opportunities: both of which processes will be accelerated, if the medical schools have the courage—and the financial strength—to close their doors to students who labor under anything more than a slight handicap. Here as elsewhere development follows hard upon actual responsibility.

Our second division constitutes the real problem; out of it additional high-grade medical schools to the number actually required must be developed. About fifty institutions, whose entrance standard approximates high school graduation, belong here. Great diversity exists in the quality of the student body of these institutions: the regents' certificates in New York, state board supervision in Michigan, the control of admission to their medical departments by the academic authorities of McGill

¹ The rule just described went into effect 1909-10; two students took advantage of it in a class of 62. In 1908 there were 254 students with degrees, 23 without.

² Cornell, Western Reserve, and Stanford combine academic and college courses to the extent of one year only. The pedagogical aspect of the combined course is discussed pp. 73, 74.

and Toronto, insure as capable and homogeneous an enrolment as is obtainable at or about the high school level. A few others, not so well protected, are within measurable distance of the same category,—the medical department of Tulane University and Jefferson Medical College (Philadelphia), for example. In general, however, the schools of this division are difficult to classify;¹ for they freely admit students on bases that are not only hopelessly unequal to each other, but are even incapable of reduction to a common denominator. On their actual standards the catalogue statements throw little light: there the requirements are cast in the form of a descending scale, running from the top, down. Equally acceptable in their sight are a bachelor's degree from a college or a university, a diploma from an "accredited" high school, an examination in a few specified and several of a wide range of optional studies, and a certificate from the principal of a high school, normal school, or academy, from a "reputable instructor," from a state or city superintendent of education, or from a state board of medical examiners, that stamps the applicant as possessing the "equivalent" of a high school education. Now it is clear that the alternatives at the top are mainly decorative. The real standard is perilously close to the "equivalent" that creeps in modestly at the bottom. There is, of course, no active prejudice anywhere against Ph.D.'s and A.M.'s and A.B.'s and B.Sc.'s; they are apt to be rather conspicuously exploited, when they drift in. But they do not set the pace; they do not determine or even vitally affect the character of the school. In these instances the medical curriculum either contains the pre-medical subjects in an elementary form, or, what may be worse, tries to go ahead entirely without them. The real standard is not influenced by the presence of degree men, and the wonder is that any of them sacrifice the advantage of a superior education by resorting to these institutions. The minimum is, then, the real standard; all else is ✓ permissive; for to the needs of those admitted at the bottom the quantity and quality of the instruction must in fairness conform.

To get at the real admission standard, then, of these medical schools, one must make straight for the "equivalent." On the methods of ascertaining and enforcing that, the issue hangs. Now the "equivalent" may be defined as a device that concedes the necessity of a standard which it forthwith proceeds to evade. The professed high school basis is variously sacrificed to this so-called "equivalent." The medical schools under discussion agree to accept at face value only graduation diplomas² from "approved" or "accredited" high schools. These terms have a definite meaning: they indicate schools which, upon proper investigation, have been recognized by the state universities of their respective states, or by some other competent educational organization,—in New England, by the College Entrance Certificate Board; in the middle west, by the North Central Association. High schools and academies not acceptable at full value to state universities or to the bodies just named

¹In Part II each school is separately characterized.

²As a matter of fact, nongraduates are also admitted on certificates—a violation of standard, of course.

do not belong to the "approved" or "accredited" class: their diplomas and certificates are not, therefore, entitled to be received in satisfaction of the announced standard. They are nevertheless freely accepted. At Tufts, for example, the first year class (1909-10) numbers 151, of whom only little more than half submit credentials that actually comply with the standard; of the others, 80 are accepted from non-accredited schools on the strength of diplomas and certificates entitled to no weight on the professed standard of the Tufts Medical School.¹ This is a common occurrence. It is defended on the ground that "we know the schools." That is, however, quite impossible. The wisdom of Solomon would not suffice to determine the actual value of credentials so heterogeneous in origin and content. Universities dealing with far less various material organize registration and inspection bureaus for their protection and enlightenment. But not infrequently the medical departments of these very institutions, pretending to stand on the same basis as the academic department, refrain from seeking the aid of the university registration office. The medical department of Bowdoin is on the college campus, yet its authorities accept certificates that the college would refuse; the medical departments of Vanderbilt, Tufts, George Washington University, Creighton (Omaha), Northwestern, the Universities of Vermont and Pennsylvania,² are in easy reach of intelligent advice which they do not systematically utilize. In striking contrast, the medical department of the University of Texas at Galveston refers all credentials to the registration office of the university at Austin, the action of which is final.

If the standard were enforced, the candidates in question, not offering a graduation diploma from an accredited high school, would be compelled to enter by written examination. But the examination is, as things stand, only another method of evasion. Neither in extent nor in difficulty do the written examinations, in the relatively rare cases in which they are given, even approximate the high school standard. Nor are they meant to do so. Colleges with medical departments of the kind under discussion do not expect academic and medical students to pass the same or the same kind of examination: a special set of questions is prepared for the medical candidates, including perhaps half the subjects, and each of these traversing about half the ground covered by the academic papers. At Tufts, the medical matriculate attempts six papers, representing, all told, less than two years of high school work; and he is accepted on condition if he passes three.³ Papers of similar quality are put forward at Boston University; those at Bowdoin are more extensive and more difficult, though still below the supposedly equal academic standard. The written examinations held under the authority of the state boards in Kentucky, Pennsylvania, Missouri,⁴ are of

¹ Those still remaining are commented on below.

² The academic authorities here pass on the college year.

³ Of the class above mentioned 38 were admitted by examination.

⁴ A St. Louis cramming establishment, conducted by the wife of a teacher in a local medical school, offers to prepare in a single year, according to the Missouri standard, a boy who has never had any

the same insufficient character. In Michigan they fairly well approximate high school value,—in consequence of which they are decidedly unpopular.¹ In Illinois the written examination has been transformed into an informal after-dinner conversation between candidate and examiner, as we shall presently discover.

\ There remains still a third method of cutting below an actual high school standard,—the method indeed that provides much the most capacious loophole for the admission of unqualified students under the cloak of nominal compliance with the high school standard. The agent in the transactions about to be described is the medical examiner, appointed in some places by voluntary agreement between the schools, elsewhere delegated by the state board,² or by the superintendent of public instruction acting in its behalf, for the purpose of dealing with students who present written evidence other than the diploma of an accredited high school. It is intended and expected that this official shall enforce a high school standard. In few states is this standard achieved. The education department in New York, the state boards in Minnesota and Michigan, maintain what may be fairly called a scholastically honest high school requirement; for they require a diploma representing an organically complete secondary school education, properly guaranteed, or, in default thereof, a written examination covering about the same ground: there is no other recourse.

Elsewhere the state board is legally powerless, as in Maryland, or unwilling to antagonize the schools, as in Illinois and Kentucky. The outside examiners, agreed on by the schools in the former case, designated by law in the latter, fall far short of enforcing a high school standard. The examiner, even where distinctly well intentioned, as in Kentucky, never gets sufficient control. The schools do not want the rule enforced, and the boards are either not strong enough or not conscientious enough to withstand them. Besides, the examiners lack time, machinery, and encouragement for the proper performance of their ostensible office. They are busy men: here, a county official; there, a school principal; elsewhere, a high school professor.³ A single individual, after his regular day's work is over, without assistance of any kind, is thus expected to perform a task much more complicated than that for which Harvard, Columbia, and the University of Michigan maintain costly establishments. There is

high school training at all. It is pointed out that by matriculating at once the student may escape any subsequent advance in entrance requirements.

¹ In Ohio the examinations are fairly representative of high school values, as far as they go. But up to this time they have not covered a complete high school course and they have little influence on enrolment, as tutor-certificates are freely accepted in their stead.

² In these cases, the requirement is really a practice, not an educational regulation. But the effect is the same.

³ Occasionally the school has an "arrangement" by which defective candidates are referred to a "coach," who is simultaneously "examiner;" he thus approves his own work. This is the practice of the George Washington University medical department. Again, the school refers defective candidates to the preparatory department of its own university, and shortly after admits them on an assurance of the "equivalent" from that source. This is the Creighton school (Omaha) plan; out of 56 members of its first-year class (1908-9), 23 were admitted on certificates (not diplomas) of this kind.

no set time when candidates must appear. They drop in as they please, separately: now, before the medical school opens, again, long after; sometimes with their credentials, sometimes without them. There is no definite procedure. At times, the examiner concludes from the face of the papers; at times from the face of the candidate. The whole business is transacted in a free and easy way. In Illinois, for example, the law speaks of "preliminary" educational requirements; the state board graciously permits them to become subsequents. Students enter the medical schools, embark on the study of medicine, and at their convenience "square up"¹ with one of the examiners. An evening call is arranged; there is an informal talk, aiming to elicit what "subjects" the candidate "has had." He may, after an interview lasting from thirty minutes to two hours, and rarely including any writing, be "passed" with or without "conditions;" if with conditions, the rule requires him to reappear for a second "examination" before the beginning of the sophomore year; but nothing happens if he postpones his reappearance until a short time before graduation.² Besides, a condition in one subject may be removed by "passing" in another! "No technical questions are asked; the presumption is that the applicant won't remember details." Formerly, written examinations were used in part; but they were given up "because almost everybody failed." And it may at any moment happen that an applicant actually turned down by one examiner will be passed by another. The most flagrantly commercial of the Chicago schools³ operate "pre-medical" classes, where a hasty cram, usually at night, suffices to meet the academic requirements of the Illinois state board: "the examiner's no prude, he'll give a man a chance," said the dean of one of them.

In Pennsylvania there was until quite lately no high school requirement by law; but recent legislation fixes the high school or its equivalent, on which the better schools had previously agreed, as the legal minimum. Its value has hitherto varied. In the first place, the examiners have accepted three-year high school graduates: "They come every day and are not turned down." In the second place, the alternatives in the matter of studies are so many that he must indeed have had narrow op-

¹Quotation marks indicate throughout words taken down on the spot in the course of interviews with officials.

²New York, while dealing strictly with applicants for practice who have been educated in New York state, deals somewhat more leniently with the outsider. The New York law provides that to be "registered as maintaining a proper medical standard," a school must, among other things, "require that before beginning the course for the degree, all matriculates afford evidence of a general preliminary education equivalent to at least a four-year high school course," etc. (*Handbook* 9, April, 1908, p. 45.) As a matter of fact, a student who received his degree from a school on the accredited or registered list (*ibid.*, pp. 48-70) may, on applying for registration in New York, find his preliminary education to have been below the New York standard. In certain circumstances, he may be allowed to make good his defects, provided they are of limited scope. He is thus bringing his "preliminary" education up to standard, after he has received his M.D. degree. This is a concession that the New York Education Department makes to the loose educational administration of other states. It is to be hoped that after due notice given it may be discontinued. The offending schools may very properly be excluded from the list.

³Bennett Medical College, Illinois Medical College, Jenner Medical College, Chicago Night University, Reliance Medical College.

portunities who cannot piece together scraps enough to gain conditional admission. "The more subjects, the more points," one dean is quoted as saying. Partial certificates—a year's work taken here, a subject or part of a subject taken there—may be added up until the sum equals arithmetically the "units" of a high school course. Moreover, the same subject can be counted twice: English grammar and rhetoric are two subjects, not one; so are English literature and English classics; so biology and zoölogy. Now, aside from these duplications, it is absurd to sum up fragmentary or isolated "credits" of this kind as "equivalent" to a high school course, even if the details were each adequately tested, as they are not. For a school curriculum is an organic thing in whose continuity and interrelations its educational virtue resides. One subject bears upon another; one year reinforces another. A curriculum has, as such, unity, purpose, method. It is not merely a question of time, still less of detached specified amounts without reference to time.¹

Things are not essentially different in Baltimore, where the entire matter is regulated by voluntary action on the part of the three schools belonging to the division under consideration. The "examination" is of the usual kind: "on a strict accounting they would all fail." In Louisville, students are admitted into the local school, the medical department of the University of Louisville, by either examination or certificate. The examination covers less than a four-year high school course; certificates are accepted from two-year high schools as full satisfaction of the requirements. Worse still, the school also admits students without either, in flat disregard of its professed standard and of the state board. St. Louis, Denver, Nashville, Pittsburgh, furnish further illustration. In none of these does the examiner exact, whether through examination or in evaluation of certificates, the preliminary standard which he is ostensibly appointed to enforce. In most cases the very word "preliminary" is a misnomer, just as we have found it to be in Illinois. For example, the Ohio requirement is not really preliminary to medical education. The schools on the so-called high school or equivalent basis admit students who have not completely satisfied the examiner. Strictly speaking, these students should not be allowed to proceed to the sophomore class; for their medical school credits beyond the first year cannot count until after the admission requirements have been satisfied. Meanwhile they may have reached the senior class. And the moment they satisfy the examiner in respect to "preliminaries," now "subsequents" to the extent of two or three years, that moment their previous work in the medical school automatically becomes "good." At Vanderbilt the first-year class had been studying two months,—yet not a single "preliminary" credential had been even submitted to the examiner; at Louisville

¹ It is useless to review all the states separately, for the differences are not very significant. Ohio, however, may be instanced as a state in transit towards the Michigan standard. At present, the examiner accepts as equivalent to graduation from an approved high school several alternatives, none of which is really equivalent: (1) whole years taken in different institutions, provided they sum up four; (2) certificates from "known instructors," testifying that candidates have "made up" conditions,—no fixed periods of study being required in such cases; (3) examinations, covering hitherto less than the high school course.

work begins November 15, but students have until January 8 before even calling on that functionary. Even Michigan wavers here: for March 1, 1910, had come around before all the first-year students of the Detroit School of Medicine had satisfied the state board. In such cases the requirement may be preliminary to graduation, or to practice, or to what-not; it is absurd to regard it as preliminary to medical education. For the whole purpose of a preliminary is to guarantee a certain degree of training, maturity, and knowledge before the student crosses the threshold of the medical school, on the ground that he is not fit to cross the threshold without it; and this purpose is abandoned if he is allowed to enter without it and subsequently, by hook or crook, in hastily snatched moments, to go through the form of a perfunctory compliance that becomes complete some time before he comes up for his M.D. degree. There is no retroactive virtue in such a feat. Educational futility can go no farther. A high school "preliminary requirement," scappily accumulated as a side issue incidental to attendance in the medical school, is worse than nothing to the extent that it has interfered with undivided attention to medical study.¹

To all the disorder that prevails in schools of this grade in the United States, the Canadian schools at the same level present, with two exceptions,² a forcible contrast. There, too, "equivalents" are accepted; but they are equivalents in fact as in name, for they are probed by a series of written examinations, each three hours in length, held at a stated time and place, only and actually in advance of the opening of the medical school, entrance to which is absolutely dependent on their outcome.

The quality of the student body thus accumulated in the schools under discussion bears out the above description. "The facilities are better than the students;" "the boys are imbued with the idea of being doctors; they want to cut and prescribe; all else is theoretical;" students accepted in chemistry or physics "don't know a barometer when they see it;" "it is difficult to get a student to *want* to repeat an experiment (in physiology). They have neither curiosity nor capacity." "The machinery does n't stop the unfit." "Men get in, not because the country needs the doctors, but because the schools need the money." "What is your honest opinion of your own enrolment?" a professor in a Philadelphia school was asked. "Well, the most I would claim," he answered, "is that nobody who is absolutely worthless gets in!"

¹ Some state boards are already in possession of the legal right to enforce a preliminary requirement. The Illinois law, for example, says: "The State Board of Health shall be empowered to establish a standard of *preliminary education* deemed requisite to *admission* to a medical college in good standing" (par. 6 b, ch. 91, Hurd's *Revised Statutes*, 1908). The board is apparently free to refuse examination to any applicant whose completed entrance certificate does not bear date four years prior to his M.D. diploma. The present policy of the Illinois board thus squarely contravenes the obvious intention of the statute. Contrast with this lax procedure the Scotch requirement: "The student must within fifteen days of the commencement of study, obtain registration." (*Regulations for the Triple Qualification*, ch. i. § 2.)

² Laval University, Montreal, which admits students below grade; but they must come to the United States to practise, for they have no standing in Canada; and Western University, London, Ont., which leaves the entire question to the discretion of the student, who, it is supposed, will conform to the local requirement of the place in which he expects to settle.

We have still to deal with schools of our third division. They are most numerous in the south, but they exist in almost all medical "centers,"—San Francisco, Chicago,—there plainly on the sufferance of the state board, for the law, if enforced, would stamp them out,—St. Louis and Baltimore. Outside the south they usually make some pretense of requiring the "equivalent" of a high school education; but no examiner of any kind is employed, and the deans are extremely reluctant to be pinned down. Southern schools of this division, after specifying an impressive series of acceptable credentials ranging once more from university degrees downward, announce their satisfaction with a "grammar school followed by two years of a high school," or in default thereof a general assurance of adequate "scholastic attainments" by a state, city, or county superintendent, or some other person connected with education or purporting to be such; but the lack of such credentials is not very serious, for the student is admitted without them, with leave to procure them later. Many of the schools accept students from the grammar schools. Credentials, if presented, are casually regarded and then usually returned; a few may be found, rolled up in a rubber band, in a dusty pigeonhole. There is no protection against fraud or forgery. At the College of Medicine and Surgery, Chicago, a thorough search for credentials or some record of them was made by the secretary and several members of the faculty, through desk drawers, safe, etc., but without avail. The school is nevertheless in "good standing" with the Illinois state board, and is "accredited" by the New York Education Department to the extent of three years' work. At the medical department of the University of Georgia I was told: "We go a long way on faith." In visits to medical colleges certificates were found from non-existent schools as well as from non-existent places.¹ Of course a few fairly competent students may be found sprinkled in these institutions. But for the most part, the student body gets in on the "equivalent." At the Atlanta School of Medicine, 73 per cent of last year's first-year class entered thus; at the Mississippi Medical College (Meridian, Mississippi), 80 per cent; at Birmingham Medical College, 62 per cent. In point of quality, the classes are not competent to use such opportunities as are provided. In Atlanta the Grady Hospital is open for bedside clinics to groups of six students; on the average, two come. In Chattanooga it is "rare to get a medical student who knows even a little algebra; it is impossible to use with medical students the text-books in science used in freshman academic classes." At Charlotte I was told that "it is idle to talk of real laboratory work for

¹ Accepted certificates are in this form:

To....., Dean:

Sir: I have examined Mr. of, and find his scholastic attainments equal to those requisite for a first-grade teacher's certificate in our public schools, with the equivalent of two years of high school study.

Yours very truly,

(Sign here) Superintendent of Public Instruction.

These are furnished to the student by the medical college; he needs only to have them signed. The college does not investigate the signature; no official mark or seal is asked. Even the medical department of Vanderbilt accepts preliminary certificates in this form.

students so ignorant and clumsy. Many of them, gotten through advertising, would make better farmers. There's no use in having apparatus for experimental physiology—the men could n't use it; they're all thumbs."

Statistical proof of inadequacy of preparation is furnished by what one may fairly call the abnormal mortality within schools operating on the basis of "equivalents." The standards of promotion in these schools watch narrowly the action of the state boards, which are usually lenient. The schools are too weak financially to do otherwise; doubtful points are resolved in the boy's favor.¹ Hence the school examinations play less havoc than would follow tests strictly constructed in the public interest. Yet the mortality from one cause or another by the close of the first year runs from 20 to 50 per cent. At the Medico-Chirurgical College of Philadelphia an initial first-year enrolment of 152 in October fell to 100² by the following January first; of these, 60 passed without conditions, much less than one-half the original class enrolment; at Tufts the entering class 1908-9 shows in the catalogue an enrolment of 141; 75 were promoted, with or without conditions, into the sophomore class;³ at Cornell, on its former high school basis, the failures at the close of the first year in a period of ten years averaged 28 per cent; at Buffalo, the failed and conditioned of three successive first-year classes amounted to 40 per cent of the total enrolment; at Vanderbilt, out of a class of 70, the dropped, conditioned, and failed amounted to 44 per cent; at the College of Physicians and Surgeons, Atlanta, 70 per cent, out of a class of 99. In schools on the higher basis, *i.e.*, two years of college work or better, the instruction is more elaborate, the work more difficult, and the examinations harder; for scientific ideals rather than chances with the state board dominate. Yet the mortality drops decisively. At the Johns Hopkins, the mortality during three successive years averages less than 5 per cent, only half of which is due to failure; at Ann Arbor, on the one-year college basis, the mortality is below 10 per cent. The exhibit made by institutions that have tried both standards is especially instructive. At the University of Missouri, during the last three years of the high school or equivalent basis, there was a mortality due to actual failure of 35 per cent; during the following three years, when one year of college work was required, the mortality fell to 12½ per cent. At the medical department of the University of Minnesota, during the last three years of the high school requirement, the mortality was

¹ The dean of one school admitted that he carried "men easily from class to class, but plucked them in the last year,"—an excellent thing for the school: it collects three years' fees and still avoids a low record in the state board examinations.

² Some dropped out because unable to qualify, a few for lack of funds, others because of inability to do the work; but the enormous number that drop or fail throws a strong light on the miscellaneous character of the enrolment obtained on the "equivalent" basis.

³ It is relatively immaterial to our argument what became of the other 66; they represent fatalities for most of which low standards are to blame. As a matter of fact they are thus accounted for: 14 were dropped students (not catalogued with their class on account of conditions); 20 failed of promotion; 17 took all or a portion of first-year examinations 1908-9, but did not return 1909-10; 15 left before the final examinations.

18 per cent;¹ in the three years following, on the basis of one year of college work, the mortality was about 10 per cent. At the University of Virginia, in the last two years on the old basis, 38 per cent of the students failed in one or more subjects; an increase in entrance requirements by one college year reduces the fatalities to 14 per cent, despite the augmented difficulty of the work. The medical department of the University of Texas has gradually advanced from a two-year high school basis to a four-year high school basis; on the lower standard there were 34 per cent of hopeless failures in 1903, as against 13 per cent of hopeless failures in 1908, on the higher. The requirement of a college year assists doubly,—first, in eliminating the sham equivalents; next, in strengthening the equipment of those who actually persist. ✓ Canada accomplishes the former by means of the examinations already noticed, with the result that the mortality there is distinctly less than ours, at something like the same ostensible level.²

The breaches made by the fatalities above described are repaired by immigration, which on investigation proves to be in most instances only another way of evading standards,—entrance and other. To some extent, good students who find themselves in a poor school endeavor to retrieve their error by transferring themselves to a better; again, there is a certain amount of enforced emigration annually from schools that, like the University of Wisconsin, offer medical instruction in the first two years only. In the main, however, the “lame ducks” move, and, strangely enough, into schools that are at the moment engaged in rejecting a number equally lame. The interchange is veiled by pretended examinations; but the character of the examination can be guessed from the quality of the students that pass it. Two standards are thus often broken at once: An ill equipped student registers in a low-grade Chicago school. At the close of a year or two, he transfers to the College of Physicians and Surgeons, which might have declined him originally. He has thus circumvented its admission requirements. If, now, he has previously failed in the medical courses so far pursued, and succeeds “on examination” in passing, he has simultaneously circumvented the professional requirements as well. Instances of both kinds abound in schools at and below the high school basis. In 1908–9 the Medico-Chirurgical College of Philadelphia accepted failures from the Jefferson Medical College and

¹ This relatively low mortality is to be ascribed to the fact that the student body, though on the high school basis, contained no “equivalents.”

² A tabular statement will perhaps help to bring these facts home. Three institutions on the high basis (Johns Hopkins, Harvard, University of Minnesota) show:

<i>Total enrolment</i>	<i>Dropped before examinations</i>	<i>Failed and conditioned</i>	<i>Passed without conditions</i>
757	2 per cent	17 per cent	81 per cent

Seven of the strongest schools in the United States on the high school or equivalent basis (Jefferson Medical, New York University, University of Maryland, Medico-Chirurgical, Tufts, Yale, and University of Pennsylvania (the last two before elevating their standard) show:

2280	11 per cent	38 per cent	51 per cent
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McGill and Toronto show:

945	5 per cent	28 per cent	67 per cent
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the University of Pennsylvania and advanced them to the classes to which they had been denied promotion by the teachers who knew them best; at the same time the Jefferson Medical College¹ itself accepted and in the same way advanced failures from New York University and the University of Pennsylvania; Tufts admits as "specials" students failed at Dartmouth, Queen's (Kingston, Ontario), and the Medico-Chirurgical of Philadelphia; the medical department of the University of Illinois (College of Physicians and Surgeons, Chicago) fairly abounds in rejected students from other schools, and in emigrated students from the low-grade institutions of Chicago and elsewhere; of the same character is a large part of the enrolment of the medical department of Valparaiso University. Failures from Ann Arbor are regarded as worthy of advancement by Northwestern (Chicago). The Physicians and Surgeons of Baltimore gives time and subject credit—after "examination," of course—to failures turned out of the University of Buffalo, New York University, the University of Pennsylvania, the Jefferson Medical College, and Yale; the University of Maryland is equally indiscriminate, advancing to the classes which they had failed to reach students from most of the same institutions and some from the local College of Physicians and Surgeons and the Baltimore Medical College, besides. Other Jefferson Medical failures, not to be found in the two Baltimore schools just named, should be looked for in the Baltimore Medical College, together with failures from Tufts, Long Island Hospital Medical College, etc. The upper classes of two Baltimore schools—the Maryland Medical College and the Atlantic Medical College—are largely recruited by emigration from other schools;² the latter of these had (1908-9) a senior class of 81, a freshman class of 1,—and every member of the senior class had been admitted to advanced standing from some other school.³

Is this the best that can be done? Will the actual enforcement of a real and adequate standard starve any section of the country in the matter of physicians?

The question can be answered without guesswork or speculation. The south requires something like 400 doctors annually.⁴ How high a standard can it enforce, and still get them? In the year 1908-9 there were 15,791 male students in four-year high schools in six southern states,⁵—Alabama, Georgia, Louisiana, South Carolina, Vir-

¹ This institution, like others, admits to advanced standing a considerable number of students from schools whose entrance requirements are much below its own; *e.g.*, in the session above referred to, there were several students from the medical department of Fort Worth University, whose entrance requirement is nominal; from the University of Oregon, College of Physicians and Surgeons, San Francisco, Keokuk, Denver and Gross. At the same time, it deals severely with its own student body, for it refuses promotion annually to a large number, who emigrate chiefly to Baltimore.

² Mississippi Medical College, Meridian, was similarly recruited.

³ Among other schools guilty of advancing students to whom promotion had been refused by their own schools may be mentioned: College of Physicians and Surgeons, Atlanta, Georgetown University (Washington, D. C.), Denver and Gross, University of Colorado, George Washington University, Milwaukee Medical College.

⁴ The former secretary of the Southern Medical College Association calculated that 300 would suffice.

⁵ For these figures we are indebted to a painstaking census conducted by the secondary school inspectors maintained in these states by the General Education Board.

ginia and Texas; there were in the previous year 5877 male students in the academic departments of the southern state universities, and 1658 more in endowed institutions of similar grade;¹ a population of over 23,000² bordering on high school graduation and widely distributed over the entire area. Our question is thus already answered. The best material for the making of a few hundred southern doctors annually does not have to be torn from the plough.

But these figures convey by no means the whole truth. The south is in the midst of a genuine educational renaissance. Within the last few years every southern state under the leadership of the state university, the state department of education, and certain endowed institutions like Vanderbilt University, has set enthusiastically to work to develop its common and secondary school systems after the admirable model furnished by the robust communities of the middle west. The professors of secondary education in the state universities are the evangelists of this auspicious movement. Young, intelligent, well trained, these sturdy leaders ceaselessly traverse the length and breadth of their respective states, stimulating, suggesting, guiding, organizing. It is an inspiring spectacle. Three years ago the high school had no legal standing in Virginia; to-day the state is dotted with two-year, three-year, and four-year high schools, created by local taxation, with a considerable subvention from the state treasury. There are already 2511 boys in fairly well equipped four-year high schools, and as many more in private institutions of equal value; and the two-year and three-year schools are growing rapidly into fuller high school stature. It needs no argument to prove that Virginia can at once procure its doctors from among the *bona-fide* graduates of such high schools and better. What is true of Virginia is true of every other southern state. In Alabama, for example, three years ago there was scarcely a public high school in the state; to-day there are 61 public four-year high schools,³ 11 private four-year high schools, and 15 town and city three-year high schools. Of the 345 teachers employed in these schools, 184 are college graduates and 55 more have had at least two years of college work. Of course the situation is uneven; it lacks homogeneity. Standards are more or less confused; distinctions are not everywhere clear. The schools have frequently shot up like ungainly boys, who first get their height and fill up afterwards; their four years are not yet the four years of Boston or Indianapolis. But this is a phenomenon of hopeful omen; it provides the framework for a vigorous and imminent maturity. The universities and the professional schools have in this emergency a clear duty: to call things by their right names, to abandon the apologetic attitude, to cease from compromises which tempt the student from the high school and then set up the successful temptation as a sufficient excuse for their

¹ Compiled from the Report of the United States Commissioner of Education, 1906.

² Not including four-year high schools of Mississippi, Florida, North Carolina, Tennessee, Arkansas, and Kentucky, which would considerably increase these figures. They are omitted because equally reliable data are not at hand.

³ Under legislative enactment approved August 7, 1907, the state contributes \$3000 a year to aid any county that establishes its own high school.

own folly in so doing. Let them reinforce the high school by the opposite policy; they will soon perceive the needlessness of the exceptions which they still suggest, and often even require. How much longer will the southern people, generously spending themselves in the effort to create high school systems, continue to handicap their development by allowing medical education legally to rest on an ante-bellum basis?

The duty of the southern universities at this juncture is clear. They are equally bound to assist the development of the secondary school and to furnish the southern people an improved type of physician. They do both if, while actually enforcing the standard above advocated, they provide the best medical training obtainable at that level. As a matter of fact, a highly useful doctor can be trained on the high school basis if his defects, frankly admitted, are made the occasion for more, instead of less, efficient instruction. The weak southern schools apologize for their wretchedness by alleging the shortcomings of the student body. But the shortcomings of the students are a call for better, rather than an excuse for worse, teaching. On the whole, a southern university will for a time probably do best to put its strength unreservedly into the improved instruction of a larger body of students at the high school level, rather than to train a smaller body on a somewhat higher basis. What with the other influences working to discredit the proprietary medical school, if Tulane, Vanderbilt, and Texas furnish actual high school graduates with an education as good as that of Toronto or of McGill, they will soon get control of the field, they will educate the southern public to look to them for their physicians, and they will induce the state legislatures to support a position undeniably reasonable, so that when they at last make the upward move, there will be no low-grade medical schools to profit by the step and to make it a pretext for the continuance of commercialism in medical education.¹

The state of Texas has taken a sound and yet conservative position. Beginning with 1909, it has decreed a gradual annual rise of standard that will shortly result in making its four-year high school the legal basis of medical education. Cautious elevation thus avoids all danger of breaking with the state school system. The statute is not free from defects, for it provides for the acceptance, at their face value, of the medical student certificates of reciprocating states; but the Texas state board, having dealt vigorously with the worst of the Texas schools, will in all probability make effective use of the power in its hands. Other southern states must inevitably follow. It is of course important that they should not move faster than their educational facilities; but it is equally important that they should not move any more slowly. Thus far, Texas alone has made an effort to keep pace.

The situation is even clearer, in so far as it touches the rest of the country. We estimate² that outside the south 1500 doctors annually graduated will provide for

¹ For more detailed consideration on this point, the reader is referred to the discussions in Part II of the various southern states.

² In chapter ix.

all the real and many imaginary needs. There are at this date something like 8000 public and over 1000 private high schools, so widely dispersed over the area under consideration that on the average few boys need go over five miles to school.¹ In the public high schools alone there are enrolled 800,000 boys.² What excuse exists for cutting under the high school? We can indeed do better than to accept as the basis of a medical education the high school "flat." In the colleges, universities, and technical schools of the north and west, exclusive of preparatory and professional departments, there were in 1908, 120,000³ male students. The number swells with unprecedented rapidity; long before the country has digested the number of doctors now struggling for a livelihood, it will have doubled. Already in 1907, 908 of the doctors graduated in that year held academic degrees; that is to say, fully one-half of the number the country actually needed could conform to the standard that has been urged, or better. There is at this moment absolutely nothing in the educational situation outside the south that countenances the least departure from the scientific basis necessary to the successful pursuit of modern medicine.

For whose sake is it permitted? Not really for the remote mountain districts of the south, for example, whence the "yarb doctor," unschooled and unlicensed, can in no event be dislodged; nor yet for that twilight zone, on the hither edge of which so many low-grade doctors huddle that there is no decent living for those already there and no tempting prospect for anybody better: ostensibly, "for the poor boy." For his sake, the terms of entrance upon a medical career must be kept low and easy. We have no right, it is urged, to set up standards which will close the profession to "poor boys."

What are the merits of this contention? The medical profession is a social organ, created not for the purpose of gratifying the inclinations or preferences of certain individuals, but as a means of promoting health, physical vigor, happiness—and the economic independence and efficiency immediately connected with these factors. Whether most men support themselves or become charges on the community depends on their keeping well, or if ill, promptly getting well. Now, can anyone seriously contend that in the midst of abundant educational resources, a congenial or profitable career in medicine is to be made for an individual regardless of his capacity to satisfy the purpose for which the profession exists? It is right to sympathize with those who lack only opportunity; still better to assist them in surmounting obstacles; but not at the price of certain injury to the common weal. Commiseration for the hand-spinner was not suffered for one moment to defeat the general economic advantage procurable through machine-made cloth. Yet the hand-spinner had a sort of vested right: society had tacitly induced him to enter the trade; he had grown up in it on that assurance; and he was now good for nothing else. Your "poor boy"

¹ Wilgus, *Legal Education in the United States*, p. 99.

² There are 33,000 more in the preparatory departments of colleges and universities.

³ We are indebted for these statistics to the United States Commissioner of Education.

has no right, natural, indefeasible, or acquired, to enter upon the practice of medicine unless it is best for society that he should.

As a matter of fact, the attainments required by our entire argument are not, as a rule, beyond the reach of the earnest poor boy. He need only take thought in good season, lay his plans, be prudent, and stick to his purpose. Without these qualities, medicine is no calling for him; with them, poverty will rarely block his way. Besides, if poverty is to be a factor in determining entrance standards, just where does poverty cease to excuse ignorance? Apparently the inexcusable degree of ignorance begins just where the ability to pay fees leaves off. For the schools that maintain "equivalents" for the sake of the "poor boy" are not cheap, and the student who can pay his expenses in them can also pay for something better, and pay his fees the student must; for it is precisely the proprietary and independent schools, avowedly solicitous for the "poor boy," that do the least for him by way of scholarship or other exemption.¹ They exact a complete settlement in cash or notes. Thus a four-year medical education in Baltimore, Philadelphia, or Chicago schools, on the "equivalent" basis, costs a boy in tuition fees and board about \$1420. The same student can go to Ann Arbor, get there two years of college work in the pre-medical sciences and modern languages, and four years in medicine, besides, for an expenditure of \$1466, covering the same items. Thus six years at Ann Arbor are not appreciably more expensive than four years in Baltimore, Philadelphia, or Chicago. Or, if a large city be preferred, he can get his two years in the admirable pre-medical laboratories of the University of Minnesota, at Minneapolis, followed by his four-year medical work there, for very little more. Low entrance requirements flourish, then, for the benefit of the poor school, not of the poor boy. Meanwhile, opportunities exist, in a measure during the school year, still more during vacation, to earn part, perhaps all, of the required sum.² Doubtless in the near future, the problem will be still further simplified in the interest of the better training by increased scholarship and other endowments, as in Germany. Meanwhile, it is dubious educational philanthropy to interrupt a poor boy's struggle upwards by inviting him into a medical school where there are excessively large chances of failure, escaping which he is at once exposed to a disadvantageous competition with men better trained by far.

So much from the standpoint of the individual. The proper method of calculating cost is, however, social. Society defrays the expense of training and maintaining the medical corps. In the long run which imposes the greater burden on the community,—

¹Three scholarships, amounting to tuition fees for one year, are, however, annually awarded at the University of Maryland.

²It is stated that at the University of Chicago "the opportunities for taking work are more numerous than the number of students desiring to take advantage of them. . . . There is ample opportunity for the energetic student to earn his way, either in whole or in part, and opportunities usually outnumber those seeking them." *School Review*, January, 1910 (Notes and News). It must, of course, be remembered that only the vigorous and talented can afford to undertake the study of medicine under such conditions. The others are barred just as effectively from the low-grade as from the high-grade school. Students are found "working their way through" at the medical departments of Harvard, Michigan, Toronto, McGill, etc.

the training of a needlessly vast body of inferior men, a large proportion of whom break down, or that of a smaller body of competent men who actually achieve their purpose? When to the direct waste here in question there is added the indirect loss due to incompetency, it is clear that the more expensive type is decidedly the cheaper. Aside from interest on investment, from loss by withdrawal of the student body from productive occupations, the cost of our present system of medical education is annually about \$8,000,000, as paid in tuition fees alone. The number of high-grade physicians really required could be educated for much less; the others would be profitably employed elsewhere; and society would be still further enriched by efficient medical service.

The argument is apt to shift at this point. If we refuse to be moved by the "poor boy," pity the small towns; for it is speciously argued that the well trained, college-bred student will scorn them. Not sympathy for the poor boy requires us now to sacrifice the small town to him, but sympathy for the small town requires us to sacrifice the poor boy to it. Two vital considerations are overlooked in this plea. In the first place, the small town needs the best and not the worst doctor procurable. For the country doctor has only himself to rely on: he cannot in every pinch hail specialist, expert, and nurse. On his own skill, knowledge, resourcefulness, the welfare of his patient altogether depends. The rural district is therefore entitled to the best trained physician that can be induced to go there. But, we are told, the well trained man will not go; he will not pay for a high-grade medical education and then content himself with a modest return on his investment. Now the six-year medical education (that based on two college years) and the four-year medical education (that based on the high school or equivalent) may, as we saw above, be made to cost the same sum. As far as cost is concerned, then, the better sort of four-year medical education must have precisely the same effect on distribution of doctors as the six-year training furnished by the state universities. If a Jefferson graduate is not deterred by the cost of his education from seeking a livelihood in the country, the Ann Arbor or Minnesota man will not be deterred, either. But a deeper question may be raised. What is the financial inducement that persuades men scientifically inclined to do what they really like?—for a man who does not like medicine has no business in it. How far does the investment point of view actually control? Complete and reliable data are at hand. The college professor has procured for himself an even more elaborate and expensive training than has here been advocated for the prospective physician. Did he require the assurance of large dividends on his investment? "The full professor in the one hundred institutions in the United States and Canada which are financially strongest receives on the average an annual compensation of approximately \$2500."¹ But the scholar does not usually advance beyond the assistant professorship: what figure has financial reward cut with him? "At the age of twenty-six or twenty-seven, after seven years of collegiate and graduate study, involving not only considerable outlay,

¹ "The Financial Status of the Professor in America and in Germany," *Carnegie Foundation for the Advancement of Teaching*, Bulletin II., p. vi.

but also the important item of the foregoing of earning during this period, he is the proud possessor of his Ph. D. and is ready to enter his profession. The next five years he spends as instructor. In his thirty-second year he reaches assistant professorship. He is now in his thirty-seventh year, having been an assistant professor for five years. His average salary for the ten years has been \$1325. . . . At thirty-seven he is married, has one child, and a salary of \$1800."¹ In Germany "the road to a professorship involves a period of training and of self-denial far longer and more exacting than that to which the American professor submits;"² in France "there are no pecuniary prizes whatever in their calling for even those who attain its highest posts."³ What is even more to the point,—the posts of instructor and assistant in small colleges situated in out-of-the-way places can be readily filled at slender salaries with expensively trained men. Of course there are compensations. But the point is that a large financial inducement is not indispensable, provided a man is doing what he likes. In most sections the country doctor has better worldly prospects. The fact stands out that it is not income but taste that primarily attracts men into scholarly or professional life. That granted, the prospect of a modest income does not effectually deter; and not infrequently the charm of living away from large cities may even attract.

Our limited experience with physicians trained at a high level sustains this view. We have thus far produced relatively few college-bred physicians; large cities have bid high for them, without, however, bagging all. Johns Hopkins graduates in medicine, to take the highest quality the country has produced, are already scattered through thirty-two states and territories. As if to prove that money is not the sole deciding consideration, a dozen have gone as missionaries to the Orient and several into the army and navy. In this country there is a Johns Hopkins man practising at Clayton, Alabama, with 1000 inhabitants; at Fort Egbert, Alaska, with 458; at Gorham, Colorado, with 364; at Chattahoochee, Florida, with 460; at Fort Bayard, New Mexico, with 724; at Sonyea, New York, with 300; at Blue Ridge Summit, Pennsylvania, with 50; at Wells River, Vermont, with 660; at Fairfax, Virginia, with 200; at Fort Casey, Washington, with 300; at Kimball, West Virginia, with 2000; at Mazomanie, Wisconsin, with 900. They have scattered to the four winds, and inevitably.⁴ No single influence controls: home, money, taste, opportunity, all figure. When we have produced as large a number of well trained doctors as Germany, they will be found in our villages, just as one finds them over there. Minnesota, closed after 1912 to all low-grade graduates, Kansas and North and South Dakota, agricultural states, Con-

¹ Statistics from twenty leading universities, discussed by Guido H. Marx in address, *The Problem of the Assistant Professor*, before Association of American Universities, January, 1910.

² *Carnegie Foundation*, Bulletin II., p. vii.

³ Bodley: *France*, vol. i. p. 54.

⁴ Western Reserve men (three years of college required for entrance) are to be found in Cochranton, Pennsylvania (population, 724); Solon Springs, Wisconsin (population, 400); Kinsman, Ohio (population, 824); Rawson, Ohio (population, 553).

necticut, Indiana, Colorado, look forward confidently to the high standard basis. Is there any reason founded in consideration for public welfare which holds back Illinois, New York, Pennsylvania, from similar action?

There is, however, still another standpoint from which the question under discussion ought to be viewed. We have been endeavoring to combat the argument in favor of admittedly inferior schools dependent on fees on the ground that in the east, north, and west, these schools have already outlived their usefulness; that, even in the south, the need, greatly exaggerated, will gradually disappear. Let us, however, for the moment concede that the south, and perhaps other parts of the country, still require some medical schools operating on the high school basis, or a little less. Does it follow that the proprietary or independent unendowed medical school has thereby established its place? By no means. It is precisely the inferior medical student who requires the superior medical school. His responsibilities are going to be as heavy as those of his better trained fellow practitioner: to be equally trustworthy, his instruction must be better, not worse. The less he brings to the school, the more the school must do for him. The necessity of recruiting the medical school with high school boys is therefore the final argument in favor of fewer schools, with better equipment, conducted by skilful professional teachers.

The truth is that existing conditions are defended only by way of keeping unnecessary medical schools alive. The change to a higher standard could be fatal to many of them without in the least threatening social needs. Momentarily there would be a sharp shrinkage. But forethought would be thus effectively stimulated; trained men would be attracted into the field; readjustment would be complete long before any community felt the pinch.¹ Despite prevailing confusion—legal, popular, and educational—as to what good training in medicine demands, the enrolment in the five schools which have during the last four years required two or more years of college work is already 1186 students, and is increasing rapidly.² When the Johns Hopkins plans were under discussion in the middle seventies, Dr. John S. Billings, the adviser of the trustees in things medical, suggested that the graduating class be limited to twenty-five. "I think it will be many years before the number of twenty-five for the graduating class can be reached," he said.³ The school opened in 1893; the first class, graduated in 1897, numbered 15; the third, graduated in 1899, numbered 32: so promptly did the country respond. Institutions that have switched from the high

¹ It has been calculated that in the supply of doctors the country is now "about thirty-five years in advance of the requirements"! Benedict: *Journal of American Medical Association*, vol. lii., no. 5, pp. 378, 379.

² In the sixteen schools on the two-year college basis there were (1908-9) 1850 students who had entered at that level. The total enrolment in these sixteen institutions was much greater, because the upper classes in several had entered on a lower basis. These figures are far from the total number of college men in medical schools. The pity is that they are scattered through institutions in which they lose the advantage which their education should give them.

³ *Medical Education: Extracts from Lectures before the Johns Hopkins University, 1877-8*, p. 22 (Baltimore, 1878).

school to the college standard after due notice given¹ have thus far lost only one-half or less of their former enrolment. The only thing that falls in proportion is the income from fees; the percentage of graduates is reduced much less. At the University of Minnesota, there used to be an average first-year attendance of 80 on the high school basis; on the two-year college basis it is now 40; at Harvard on the former basis, 160 new matriculants; now, on a college basis, 79. Western Reserve, with 84 on the high school basis, advanced suddenly in 1901 to a three-year college requirement; the enrolment fell to 12, but by 1908 the loss was practically recovered. Most significant is the demonstration that the greatest loss is due to the transition from the high school or equivalent to the one-year college basis; the rise from one to two years of college has relatively little effect on enrolment. It would appear that the college requirement compels deliberation. Once decided, the student is not seriously hampered by the effort or the expense of an additional year.

It does not follow, however, that if schools generally rose to the college requirement, their losses would be only one-half and the recovery therefrom ultimately assured. For the schools that came off thus lightly were previously attended by a large proportion of high-grade men.² A much greater loss would undoubtedly take place in the lower-grade schools; many of them would be practically annihilated. For the tendency of elevated standards and ideals is to reduce the number of students to something like parity with the demand, and to concentrate this reduced student body in fewer institutions, adequately supported.

The basis which we have urged for medical education gives an undoubted advantage to the university medical departments. We shall see in subsequent chapters that other equally important factors are at work tending to restore medical education to the university status; but for the moment the difficulty of procuring anywhere else the necessary educational foundation is perhaps most cogent. A countermove, by way of avoiding this tendency, has recently emanated from certain Philadelphia schools,³ in the form of a suggested five-year course, the first year to be devoted to the pre-medical sciences.

Several serious objections to this proposition may be urged: (1) a single year is insufficient for three laboratory sciences, and makes no provision for modern languages; the very best medical schools could with difficulty give one year's pre-medi-

¹ Cornell changed from the high school to the three-year college requirement with less than a year's notice. There was, of course, no chance to readjust matters; the next first-year class (1908) numbered 16; in 1909, this increased to 23.

² In these schools standards were elevated in advance of the operation of the formal declaration to that effect. For example, Columbia (College of Physicians and Surgeons, New York) goes to the two-year college basis 1910-11; but the entering class 1909-10 contained among its 86 matriculates 48 students with degrees, and 11 more who had had two years of college work.

³ These schools have no endowments; and the pre-medical sciences cannot be properly taught out of fees, as will become evident in chapter viii., "The Financial Aspects of Medical Education." Hence the work must be mainly make-believe. It would have to be given by already overburdened science teachers or, still worse, by practitioners. The Medico-Chirurgical College of Philadelphia offers these courses "in conjunction with classes in the sister department of pharmacy." This is absurd.

cal work,—they cannot possibly give two; as for anything more liberal, there is no chance at all. Hence the step would shortly prove an obstruction to further progress. (2) Unquestionably, the day is coming when the medical school proper will want a fifth or hospital year,—a culmination that will be indefinitely postponed if the year in question is prefixed to the course and assigned to preliminary training. (3) Finally, the arrangement protracts our present educational disorganization. It proposes that the medical school should do the work of the college, just as it is either doing—or doing without—the work of the high school. Now the strength of an educational system is wholly a question of the competent performance of differentiated function by each of its organic parts. Our tardily awakened educational conscience and intelligence find themselves confronted with several independent and detached educational agencies,—high schools, colleges, professional schools. Obviously, they are not indifferent to each other; they belong in a definite order and relation. We now know perfectly well what that order, what that relation, is. And the solidity of our educational and scientific progress depends on our success in making it prevail. To no inconsiderable extent, inefficiency has been due to irresponsibility resulting from just this lack of organized relationships; and the cure for evils due to lack of responsibility is not less responsibility, but more; not less differentiation, but more.

The reconstruction of our medical education on the basis of two years of required college work is not, however, going to end matters once and for all. It leaves untouched certain outlying problems that will all the more surely come into focus when the professional training of the physician is once securely established on a scientific basis. At that moment the social rôle of the physician will generally expand, and to support such expansion, he will crave a more liberal and disinterested educational experience. The question of age—not thus far important because hitherto our demands have been well within the limits of adolescence—will then require to be reckoned with. The college freshman averages nineteen years of age; two years of college work permit him to begin the study of medicine at twenty-one, to be graduated at twenty-five, to get a hospital year and begin practice at twenty-six or twenty-seven. No one familiar with the American college can lightly ask that this age be raised two years for everybody, for the sake of the additional results to be secured from non-professional college work. There is, however, little question that compression in the elementary school, closer articulation between and more effective instruction within secondary school and college, can effect economies that will give the youth of twenty-one the advantage of a complete college education. The basis of medical education will thus have been broadened without deferring the actual start. Meanwhile we are so far from endeavoring to force a single iron-clad standard on the entire country that our proposition explicitly recognizes at least three concurrent levels for the time being: (1) the state university entrance standard in the south, (2) the two-year college basis as legal minimum in the rest of the country, (3) the degree standard in a small number of institutions.

The practical problem remains. How is the existing situation to be handled? The higher standard is alike necessary and feasible. How long is it to be postponed because it threatens the existence of this school or of that? In general, our medical schools, like our colleges, are local institutions; their students come mainly from their own vicinity. The ratio of physicians to population in a given state is therefore a fair indication of the number of medical schools needed. Where physicians are superabundant, and high schools and colleges at least not lacking, the medical schools cannot effectively plead for mercy on the ground that elevated standards will be their death. New York has two schools on the two-year college basis or better; nine others rest on a lower basis. They would improve if they could "afford it."¹ But with one doctor for every 600 people in the state, with accessible high schools, with cheap—and in New York City, at least, free—colleges, it is absolutely immaterial to the public whether they can afford it or not. The public interest demands the change. We may therefore at once assume (what everybody grants) that the problem is insoluble on the basis of the survival of all or most of our present medical schools. To live, they must get students; they must get them far in excess of the number they will graduate; they must graduate them far in excess of the number of doctors needed. They will therefore require their clientele of ill prepared, discontented, drifting boys, accessible to successful solicitation on commercial lines. Inevitably, then, the way to better medical education lies through fewer medical schools; but legal enactments on the subject of medical education and practice will be required before the medical schools will either give up or relate themselves soundly to the educational resources of their respective states. No general legislation is at the moment feasible. The south, for instance, may well rest for a time, if every state will at once restrict examinations for license to candidates actually possessing the M.D. degree, and require after, say, January 1, 1911, that every such degree shall emanate from a medical school whose entrance standards are at least those of the state university. Such legislation would suppress the schools that now demoralize the situation; it would concentrate the better students in a few solvent institutions to which the next moves may safely be left. Elsewhere, every available agency should be employed to bring examining boards to reinterpret the word "equivalent" and to adopt efficient machinery for the enforcement of the intended standard. Equivalent means "equal in force, quality, and effect." The only authorities competent to pass on such values are trained experts. The entire matter would be in their hands if the state boards should in every state delegate the function of evaluating entrance credentials to a competently organized institution of learning. In many states, the state university

¹The dean of a superfluous southern medical school writes: "Our faculty gets only what's left after all expenses are paid, and that averages \$400 per session of seven months. This we will cheerfully forego, and teach gratis, if only a class, or endowment, will pay cost of running the college. We will advance to the highest requirements just as soon as the conditions will admit, and are ready now to open next session under highest requirements if the wherewith to pay expenses is in sight." Observe that there is small consideration here for the "poor boy" or the "back country;" it is simply a question of college survival.

could very properly perform this duty; elsewhere, an equally satisfactory arrangement could be made with an endowed institution. Whatever the standard fixed, it would thus be intelligently enforced. The school catalogues would then announce that no student can be matriculated whose credentials are not filed within ten days of the opening of the session, and that no M. D. degree can be conferred until at least four years subsequent to complete satisfaction of the preliminary requirement. These credentials, sent at once to the secretary of the state board, would be by him turned over to the registrar of the state or other university, whose verdict would be final. A state that desired to enforce a four-year high school requirement could specify as satisfying its requirements:

- (1) Certificate of admission to a state university requiring a four-year high school education;
- (2) Certificate of admission to any institution that is a member of the Association of American Universities;
- (3) Medical Student Certificate of the Regents of the University of the State of New York;
- (4) Certificates issued by the College Entrance Examination Board for 14 units.

In exchange for such credentials, or for high school diplomas acceptable to the academic authorities acting for the state board, a medical student certificate would be issued; in default thereof, the student must by examination earn one of the aforesaid credentials, in its turn to be made the basis of his medical student certificate. In the southern states, the legal minimum would be necessarily below the four-year high school; in Minnesota, above it. But the same sort of machinery would work. The schools would have nothing to do with it except to keep systematically registered the name of the student and the number of his certificate; the state board or the university acting for it would keep everything else, open to inspection.

This is substantially what takes place in New York, where the State Education Department superintends the process. What is wanted in other states is an agency similarly qualified. For the present nothing can so well perform the office within a given state as its state university, or, in default thereof, the best of its endowed institutions. This suggestion is perfectly fair to all medical schools, for the credentials would pass through the hands of the state board to the reviewing authority without information as to the purpose of the applicant. The directions required would take up less space in the medical school catalogues than the complicated details they now contain. It should be further provided that the original credentials of every student be kept on file in the office of the state board or the reviewing university, and that they shall be open to inspection, without notice, by properly accredited representatives of medical and educational organizations. These simple measures would introduce intelligence and sincerity where subterfuge and disorder now prevail. The beneficial results to the high school and the medical school would be incalculable. Nor would the poor boy be subjected to the least hardship; for by exercising forethought,

he could accumulate genuine scholastic credits by examination or otherwise, *pari passu*, during the time he is accumulating the money for his medical education. So much actually accomplished, the rest will be easier. The reduced number of schools will not resist the forces making for a higher legal minimum. The state universities of the west will doubtless lead this movement; for once established on the two-year college basis, they will induce the states to protect their own sons and the public health against the lower-grade doctors made elsewhere. The University of Minnesota, having by statesmanlike action got rid of all other medical schools in the state, is thus backed up by the legislature and the state board. North Dakota and Indiana have taken the same stand. Michigan and Iowa will probably soon follow. "The adjustment is perhaps difficult, but not too difficult for American strength."¹

¹Adapted from Billroth: *Ueber das Lehren und Lernen der medicinischen Wissenschaft*, quoted by Lewis, *loc. cit.*

CHAPTER IV

THE COURSE OF STUDY: THE LABORATORY BRANCHES

(A) FIRST AND SECOND YEARS

THREE characteristic stages are to be discerned in the evolution of medical teaching.¹ The first and longest was the era of dogma. Its landmarks are Hippocrates (B.C. 460–377) and Galen (A.D. 130–200), whose writings were for centuries transmitted as an authoritative canon. Observation and experience had indeed figured considerably in their composition,² but increasingly remote disciples in accepting the tradition lost all interest in its source. The Galenic system took its place in the medieval university with Euclid and Aristotle,—a thing to be pondered, expounded and learned; facts had no chance if pitted against the word of the master. So completely was medicine dominated by scholasticism that surgery, employing such base tools as sight and touch, was held to be something less than a trade and accordingly excluded from intellectual company.

The second era is that of the empiric. It began with the introduction of anatomy in the sixteenth century, but did not reach its zenith until some two hundred years later. At its best it leaned upon experience, but its means of analyzing, classifying, and interpreting phenomena were painfully limited. Medical art was still under the sway of preconceived and preternatural principles of explanation; and rigorous therapeutic measures were not uncommonly deduced from purely metaphysical assumptions. The debility of yellow fever, for example, Rush explained by “the oppressed state of the system;” and on the basis of a gratuitous abstraction, resorted freely to purging and bleeding. His first four patients recovered; there is no telling how many lives were subsequently sacrificed to this conclusive demonstration. The fact is that the empiric lacked a technique with which to distinguish between apparently similar phenomena, to organize facts, and to check up observation; the art of differentiation through controlled experimentation was as yet in its infancy. Under vague labels like rheumatism, biliousness, malaria, or congestion, a hodgepodge of dissimilar and unrelated conditions were uncritically classed; the names meant nothing, but they answered as explanation, and even sanctioned severe and nauseous medication. Ignorant of causes, the shrewdest empiric thus continued to confound totally unlike conditions on the basis of superficial symptomatic resemblance; and with amazing assurance undertook to employ in all a therapeutic procedure of doubtful value in any. He combined the vehemence of the partisan with something of the credulity of

¹ Nothing would do more to orient the student intelligently than a knowledge of the history of medical science and teaching. It is a great pity that some effort is not made in the better medical schools to interest the student in the subject. A proper historical perspective would render impossible such opposition to improved medical teaching as is now based on conscientious but mistaken devotion to outgrown conditions.

² “The correct inductive method was borne in on the triumph of Hippocrates.” Gompers’s *Greek Thinkers* (translated by Magnus, vol. i. p. 306).

a child, persuading too often by ardent insistence rather than by logical proof. His students were thus passive learners, even where the teaching was demonstrative. They studied anatomy by watching a teacher dissect; they studied therapeutics by taking the word of the lecturer or of the text-book for the efficacy of particular remedies in certain affections.

The third era is dominated by the knowledge that medicine is part and parcel of modern science. The human body belongs to the animal world. It is put together of tissues and organs, in their structure, origin, and development not essentially unlike what the biologist is otherwise familiar with; it grows, reproduces itself, decays, according to general laws. It is liable to attack by hostile physical and biological agencies; now struck with a weapon, again ravaged by parasites. The normal course of bodily activity is a matter of observation and experience; the best methods of combating interference must be learned in much the same way. Gratuitous speculation is at every stage foreign to the scientific attitude of mind.

We may then fairly describe modern medicine as characterized by a severely critical handling of experience. It is at once more skeptical and more assured than mere empiricism. For though it takes nothing on faith, the fact which it accepts does not fear the hottest fire. Scientific medicine is, however, as yet by no means all of one piece; uniform exactitude is still indefinitely remote; fortunately, scientific integrity does not depend on the perfect homogeneity of all its data and conclusions. Modern medicine deals, then, like empiricism, not only with certainties, but also with probabilities, surmises, theories. It differs from empiricism, however, in actually knowing at the moment the logical quality of the material which it handles. It knows, as empiricism never knows, where certainties stop and risks begin. Now it acts confidently, because it has facts; again cautiously, because it merely surmises; then tentatively, because it hardly more than hopes. The empiric and the scientist both theorize, but logically to very different ends. The theories of the empiric set up some unverifiable existence back of and independent of facts,—a vital essence, for example; the scientific theory is in the facts,—summing them up economically and suggesting practical measures by whose outcome it stands or falls. Scientific medicine, therefore, has its eyes open; it takes its risks consciously; it does not cure defects of knowledge by partisan heat; it is free of dogmatism and open-armed to demonstration from whatever quarter.

On the pedagogic side, modern medicine, like all scientific teaching, is characterized by activity. The student no longer merely watches, listens, memorizes; he *does*. His own activities in the laboratory and in the clinic are the main factors in his instruction and discipline. An education in medicine nowadays involves both learning and learning how; the student cannot effectively know, unless he knows how.

Two circumstances have mediated the transformation from empirical to scientific medicine: the development of physics, chemistry, and biology; the elaboration out of them of a method just as applicable to practice as to research. The essential de-

pendence of modern medicine on the physical and biological sciences, already adverted to,¹ will hereafter become increasingly obvious in the wealth of the curricula based upon them, and no less in the poverty of those constructed without them. But the practical importance of scientific method as such to the general practitioner is by no means so generally conceded. Its function in investigation is granted: there it is justified by its own fruits. But what has this to do with the education or the daily routine of the family doctor?

The question raised is fundamental; the answer decides the sort of medical education that we shall seek generally to provide. If, in a word, scientific method and interest are of slight or no importance to the ordinary practitioner of medicine,² we shall permanently establish two types of school,—the scientific type, in which enlightened and progressive men may be trained; the routine type, in which “family doctors” may be ground out wholesale. If, on the other hand, scientific method is just as valuable to the practitioner as to the investigator, it may indeed be expedient partly, or even in some instances altogether, to set aside gifted individuals as teachers or investigators and to guard the undergraduate student against original work prematurely undertaken. But this will not be construed to involve the abrupt and total segregation of medical education from medical research. Much of the educator’s duty may consist in traversing a well known path; but if otherwise he is progressively busy, the well known path will never look exactly the same twice. The medical school will in that case be more than the undergraduate curriculum. Activities will be in progress that at every point run beyond the undergraduate’s capacity and interest at the moment. But the undergraduate curriculum will not differ in spirit, method, or aspiration from the interests that transcend it.

The conservative in medical education makes much of what he conceives to be a fundamental opposition between medical practice and medical science; occasionally a despairing progressive accepts it. The family doctor represents the former type. One can ask of him—so the conservative thinks—only that he be more or less well grounded in things as they are when he gets his degree. The momentum with which he is propelled from the medical school must carry him to the end of his days,—on a gradually declining curve; but that cannot be helped. The other type—the scientific doctor—either himself “investigates,” or has a turn for picking up increases due to others. How profound is the opposition here depicted? Opposition of course there is between all things in respect to time and energy. The doctor who puts on his hat and goes out to see a sick baby cannot just then be making an autopsy on a guinea-pig dead of experimental dysentery. But does the opposition go any deeper? Is there any logical incompatibility between the science and the practice of medicine?

¹ Chapter ii. p. 94.

² This is the common contention of the routine schools that run on low admission requirements and employ practitioner teachers.

The main intellectual tool of the investigator is the working hypothesis, or theory, as it is more commonly called. The scientist is confronted by a definite situation; he observes it for the purpose of taking in all the facts. These suggest to him a line of action. He constructs a hypothesis, as we say. Upon this he acts, and the practical outcome of his procedure refutes, confirms, or modifies his theory. Between theory and fact his mind flies like a shuttle; and theory is helpful and important just to the degree in which it enables him to understand, relate, and control phenomena.

This is essentially the technique of research: wherein is it irrelevant to bedside practice? The physician, too, is confronted by a definite situation. He must needs seize its details, and only powers of observation trained in actual experimentation will enable him to do so. The patient's history, conditions, symptoms, form his data. Thereupon he, too, frames his working hypothesis, now called a diagnosis. It suggests a line of action. Is he right or wrong? Has he actually amassed all the significant facts? Does his working hypothesis properly put them together? The sick man's progress is nature's comment and criticism. The professional competency of the physician is in proportion to his ability to heed the response which nature thus makes to his ministrations. The progress of science and the scientific or intelligent practice of medicine employ, therefore, exactly the same technique. To use it, whether in investigation or in practice, the student must be trained to the positive exercise of his faculties; and if so trained, the medical school begins rather than completes his medical education. It cannot in any event transmit to him more than a fraction of the actual treasures of the science; but it can at least put him in the way of steadily increasing his holdings. A professional habit definitely formed upon scientific method will convert every detail of his practising experience into an additional factor in his effective education.

From the standpoint of the young student, the school is, of course, concerned chiefly with his acquisition of the proper knowledge, attitude, and technique. Once more, it matters not at that stage whether his destination is to be investigation or practice. In either case, as beginner, he learns chiefly what is old, known, understood. But the old, known, and understood are all alike new to him; and the teacher in presenting it to his apprehension seeks to evoke the attitude, and to carry him through the processes, of the thinker and not of the parrot.

The fact that disease is only in part accurately known does not invalidate the scientific method in practice. In the twilight region probabilities are substituted for certainties. There the physician may indeed only surmise, but, most important of all, he knows that he surmises. His procedure is tentative, observant, heedful, responsive. Meanwhile the logic of the process has not changed. The scientific physician still keeps his advantage over the empiric. He studies the actual situation with keener attention; he is freer of prejudiced prepossession; he is more conscious of liability to error. Whatever the patient may have to endure from a baffling disease, he is not further handicapped by reckless medication. In the end the scientist alone

draws the line accurately between the known, the partly known, and the unknown. The empiricist fares forth with an indiscriminate confidence which sharp lines do not disturb.

Investigation and practice are thus one in spirit, method, and object. What is apt to be regarded as a logical, is really but a practical, difficulty, due to the necessity for a division of labor. "The golden nuggets at or near the surface of things have been for the greater part discovered, it seems safe to say. We must dig deeper to find new ones of equal value, and we must often dig circuitously, with mere hints for guides."¹ If, then, we differentiate investigator and practitioner, it is because in the former case action is leisurely and indirect, in the latter case, immediate and anxious. The investigator swings around by a larger loop. But the mental qualities involved are the same. They employ the same method, the same sort of intelligence. And as they get their method and develop their intelligence in the first place at school, it follows that the modern medical school will be a productive as well as a transmitting agency. An exacting discipline cannot be imparted except in a keen atmosphere by men who are themselves "in training." Of course the business of the medical school is the making of doctors; nine-tenths of its graduates will, as Dr. Osler holds, never be anything else. But practitioners of modern medicine must be alert, systematic, thorough, critically open-minded; they will get no such training from perfunctory teachers. Educationally, then, research is required of the medical faculty because only research will keep the teachers in condition. A non-productive school, conceivably up to date to-day, would be out of date to-morrow; its dead atmosphere would soon breed a careless and unenlightened dogmatism.

Teachers of modern medicine, clinical as well as scientific, must, then, be men of active, progressive temper, with definite ideals, exacting habits in thought and work, and with still some margin for growth. No inconsiderable part of their energy and time is indeed absorbed in what is after all routine instruction; for their situation differs vastly from that of workers in non-teaching institutions devoted wholly to investigation. Their practical success depends, therefore, on their ability to carry into routine the rigor and the vigor of their research moments. A happy adjustment is in this matter by no means easy; nor has it been as yet invariably reached. Investigators, impressed with the practical importance of scientific method to the practising physician, tend perhaps to believe that it is to be acquired only in original research. A certain impatience therefore develops, and ill equipped student barks venture prematurely into uncharted seas. But the truth is that an instructor, devoting part of his day under adequate protection to investigation, can teach even the elements of his subject on rigorously scientific lines. On the other hand, it will never happen that every professor in either the medical school or the university faculty is a genuinely productive scientist. There is room for men of another type,—the

¹ C. A. Herter: "Imagination and Idealism in the Medical Sciences," *Columbia Univ. Quart.*, vol. xii., no. 11, p. 16.

non-productive, assimilative teacher of wide learning, continuous receptivity, critical sense, and responsive interest. Not infrequently these men, catholic in their sympathies, scholarly in spirit and method, prove the purveyors and distributors through whom new ideas are harmonized and made current. They preserve balance and make connections. The one person for whom there is no place in the medical school, the university, or the college, is precisely he who has hitherto generally usurped the medical field,—the scientifically dead practitioner, whose knowledge has long since come to a standstill and whose lectures, composed when he first took his chair, like pebbles rolling in a brook get smoother and smoother as the stream of time washes over them.

The student is throughout to be kept on his mettle. He does not have to be a passive learner, just because it is too early for him to be an original explorer. He can actively master and securely fix scientific technique and method in the process of acquiring the already known. From time to time a novel turn may indeed give zest to routine; but the undergraduate student of medicine will for the most part acquire the methods, standards, and habits of science by working over territory which has been traversed before, in an atmosphere freshened by the search for truth.

For purposes of convenience, the medical curriculum may be divided into two parts, according as the work is carried on mainly in laboratories or mainly in the hospital; but the distinction is only superficial, for the hospital is itself in the fullest sense a laboratory. In general, the four-year curriculum falls into two fairly equal sections: the first two years are devoted mainly¹ to laboratory sciences,—anatomy, physiology, pharmacology, pathology; the last two to clinical work in medicine, surgery, and obstetrics. The former are concerned with the study of normal and abnormal phenomena as such; the latter are busy with their practical treatment as manifested in disease. How far the earlier years should be at all conscious of the latter is a mooted question. Anatomy and physiology are ultimately biological sciences. Do the professional purposes of the medical school modify the strict biological point of view? Should the teaching of anatomy and physiology be affected by the fact that these subjects are parts of a medical curriculum? Or ought they be presented exactly as they would be presented to students of biology not intending to be physicians? A layman hesitates to offer an opinion where the doctors disagree, but the purely pedagogical standpoint may assist a determination of the issue. Perhaps a certain misconception of what is actually at stake is in a measure responsible for the issue. Scientific rigor and thoroughness are not in question. Whatever the point of view—whether purely biological or medical—scientific method is equally feasible and essential; a verdict favorable to recognition of the explicitly medical standpoint would not derogate from scientific rigor. There is no doubt that the sciences in question can be properly cultivated only in the university in their entirety

¹An introductory course in physical diagnosis is given in the second year; occasionally clinical work is begun in its latter half.

and in close association with contiguous, contributory, or overlapping sciences. No one of them is sharply demarcated; at any moment a lucky stroke may transfer a problem from pathology to chemistry or biology. There are indeed no problems in pathology which are not simultaneously problems of chemistry and biology as well. So far the rigorously and disinterestedly scientific viewpoint is valid. These considerations, however, still omit one highly important fact: medical education is a technical or professional discipline; it calls for the possession of certain portions of many sciences arranged and organized with a distinct practical purpose in view. That is what makes it a "profession." Its point of view is not that of any one of the sciences as such. It is difficult to see how separate acquisitions in several fields can be organically combined, can be brought to play upon each other, in the realization of a controlling purpose, unless this purpose is consciously present in the selection and manipulation of the material. Pathology, for example, is a study of abnormal structure and function; the pathologist as such works intensively within a circumscribed field. For the time being, it pays him to ignore bearings and complications outside his immediate territory. Undoubtedly, the progressive pathologist will always be at work upon certain problems, thus temporarily, but only temporarily, isolated. But in the undergraduate class-room he is from time to time under necessity of escaping these limitations: there he is engaged in presenting things in their relations. The autopsy, the clinical history, will be utilized in presenting to the student, even if incidentally, the total picture of disease. Similarly, the anatomist can score many a point for the physiologist without actually forestalling him. He views the body not as a mosaic to be broken up, but as a machine to be taken to pieces, the more perfectly to comprehend how it works. The pharmacologist is in a similar relation to the clinician. The principles of bacteriology lose nothing in scientific exactitude because, taught as a part of the medical curriculum, they are enforced with illustrations from the bacterial diseases of man rather than from those of animals and plants; and histology is not the less histology because tissues from the human body are preferably employed.¹ In

¹The following quotations from "An Outline of the Course in Normal Histology," by L. F. Barker and C. R. Bardeen (*Johns Hopkins Hospital Bulletin*, vol. vii., nos. 62, 63, p. 100, etc.), forcibly illustrate the above contention.

"In deciding as to the plan to be adopted we have been much influenced, too, by the fact that our students are students of medicine. Thus it will be noticed that in the selection of tissues, those from the human body make up a large part of the material used; and when animal tissues are employed, special care has been taken to point out how they differ from the human. Moreover, in deciding what to exclude from the course thought was given to the bearing of the specimens on the practical work in medicine which was to follow, and stress was laid upon those portions of human histology which previous experience has taught us are of the most importance in the appreciation and interpretation of the pathological alterations in disease. In the present status of pathological histology a knowledge of certain details is of much greater value than that of others; and for the student entering medicine, a judicious selection of what shall be given and what shall be left out should be made by some one who has had a more or less wide training in pathological histology.

"Further bearing in mind the life-work for which the student is preparing himself, we have not always chosen the method which would show the finest structural details of the tissues. While the most delicate methods have been introduced in places, we have endeavored to familiarize the students with a large number of different modes of preparation. The student who has been brought up entirely on 'gilt-edged' histological methods will find himself sadly at a loss in battling with the 'rough and ready' world in which the pathologist has to live." (Somewhat abridged.)

short, research, untrammelled by near reference to practical ends, will go on in every properly organized medical school; its critical method will dominate all teaching whatsoever; but undergraduate instruction will be throughout explicitly conscious of its professional end and aim. In no other way can all the sciences belonging to the medical curriculum be thoroughly kneaded. An active apperceptive relation must be established and maintained between laboratory and clinical experience. Such a relation cannot be one-sided; it will not spontaneously set itself up in the last two years if it is deliberately suppressed in the first two. There is no cement like interest, no stimulus like the hint of a coming practical application.¹

Medical reference, in the sense that the laboratory sciences should, while freely presented, be kept conscious of their membership in the medical curriculum, has been discredited in this country, because it had so long meant a mechanical drill in an inert outline of the several sciences by untrained and busy practitioners. In the effort to teach the modicum of chemistry or physiology or pathology that "the family doctor needs to know," they neglected to teach anything of permanent scientific value at all. A revulsion was inevitable. It was supposed that the harm was due to the simple fact of medical reference. Such was not really the case. The sciences were badly taught, not merely because they were made prematurely and excessively conscious of medical application,—though such had indeed been the case,—but because the teachers lacked abundant scientific knowledge and spirit. Had they had these, the medical reference would neither have dominated nor impoverished their presentation. Our experience then furnishes a conclusive argument against delegating the teaching function to essentially unscientific practising physicians; it does not recommend the isolation of the laboratory sciences, locally or scientifically, from the clinical work. If it meant that, then institutions like the Johns Hopkins Medical School, in which laboratories and hospital are compactly organized from the standpoint of a scientific education in medicine, would labor under a positive disadvantage as compared with schools that, by reason of their situation, must in the scientific years forego the bedside and the autopsy altogether. In sober truth, four years are none too many thoroughly to saturate the student with medical enthusiasm and to give him the physician's standpoint; nor will laboratory and clinical ends make a genuine whole unless they have throughout a speaking acquaintance with each other.

Physiology and pathology belong, then, in the university, because there is much more to them as sciences than the medical school has time for. In so far, however, as they figure in medical education, they cannot be allowed to be indifferent to this definite function. "There must be an outlying division of workers who will keep the

¹ "An individual mind appropriates those new points of view and those fragments of knowledge that find in the mind fitting points of contact; but others that fail to meet with suitable receptors, to borrow a term from the modern theory of immunity, remain unattached and alien. The more thoroughly we can utilise existing interests and established relations, the more likely is our teaching to be real training." Letter from Professor Edwin O. Jordan, University of Chicago.

subject in touch with practical medicine, though the flower of the army, the imperial guard, are busy elsewhere."¹ This same consideration would appear conclusive as to the wisdom of crediting the medical student with such subjects when pursued in a college of liberal arts. Physiology, for instance, as an element of a liberal education, sweeps the whole horizon impartially, interested in genetic processes, searching for general laws. It works to best advantage with simple forms,—with jellyfish and cats in preference to man: an admirable introduction to medical physiology, but not really the same thing. It does not follow, therefore, that because professional studies are now freely counted toward the bachelor's degree, ordinary college work in physiology is equally satisfactory to the medical school. The academic purpose is vague; the professional purpose, distinct; and a medical education is more than the sum of its constituent courses taken separately and without reference to their ultimate object.²

So much for the point of view; certain general considerations affect equally instruction in all these laboratory sciences. The medical laboratories must be manned, equipped, and organized like university laboratories devoted to non-medical subjects. The laboratory staff consists necessarily of a chief—the professor in charge—with a corps of paid assistants, coöperating with him in the work of teaching, busy at other times with their problems, as he is with his, and with at least one intelligent departmental helper (*Diener*) who will relieve the staff of the care and handling of apparatus and material. The needs of pharmacology are in these respects not different from those of physics; and the pharmacologist can as little make the teaching of pharmacology a side issue to the practice of medicine or the conduct of a drug store as the physicist can subordinate his academic duties to the operation of a trolley line. Hardly less urgent is an adequate material equipment: class-rooms, laboratories for class use, private rooms adapted to the independent work of the staff, a reference library in regular receipt of important publications, and proper quarters for caring for an abundant and varied supply of animals.³

In methods of instruction there is, once more, nothing to distinguish medical from other sciences. Out-and-out didactic treatment is hopelessly antiquated; it belongs

¹ W. H. Howell: "The Present Problems of Physiology," *Congress of Arts and Sciences*, vol. v. p. 434. More concretely, Professor F. S. Lee (Columbia University), in discussing the medical curriculum, wrote: "Many experiments of merely technical physiological interest should be omitted, especially those that have only a remote connection with human physiology. . . . [In physiological chemistry] pathological constituents [of tissues and secretions] and changes should be touched upon." Professor Matthews (University of Chicago) took the opposite position. "As soon as possible these sciences should follow the example of physics, botany, and chemistry and leave the medical faculty and be regarded as subjects prerequisite to the study of medicine." The analogy seems hardly valid; physics and chemistry are, from the standpoint of medicine, of merely instrumental value. The medical sciences are not simply instrumental; they deal with the actual phenomena and material which the physician handles. Professor Lee employs pathological cases to illustrate and enrich his course in physiology at Columbia. The contrast between normal and abnormal deepens the student's impression of both.

² The same problem presents itself in the German university. See Paulsen, *loc. cit.*, pp. 411, 412.

³ An utterly mistaken notion prevails as to the extent to which animal experimentation is practised in this country. Only a very small minority of our medical schools use animals at all; as a matter of fact, ordinary medical teaching suffers seriously from the failure to employ them.

to an age of accepted dogma or supposedly complete information, when the professor "knew" and the students "learned." The lecture indeed continues of limited use. It may be employed in beginning a subject to orient the student, to indicate relations, to forecast a line of study in its practical bearings; from time to time, too, a lecture may profitably sum up, interpret, and relate results experimentally ascertained. Text-books, atlases, charts, occupy a similar position. They are not, in the first place, a substitute for sense experience, but they may well guide and fill out the student's laboratory findings. In general, the value of the recitation and of the quiz is in proportion to their concreteness and informality. Outside the workshop there is danger of detachment and rote.

The curriculum of a medical school, requiring for admission at least a competent knowledge of physica, chemistry, and biology, offers in the first two years systematic instruction in the following subjects:

First year: anatomy, including histology and embryology; physiology, including bio-chemistry.

Second year: pharmacology, pathology, bacteriology, physical diagnosis.

A brief discussion will show the relations of these subjects to each other and to the clinical work occupying the third and fourth years.

The order in which subjects are taken up is largely determined by considerations inherent in the subjects themselves. Anatomy—the study of the architecture of the body—comes logically first. It is indeed the oldest of laboratory sciences,¹ and so fundamental in medical study that for a time the student may well defer all other subjects whatsoever. For several centuries it was taught simply by professorial demonstration. During the first half of the nineteenth century, gross dissection by the students themselves was in vogue. The subject, long almost a closed book, has tremendously expanded in recent years. Embryology, histology, physiology, and pathology have given it back its youth; it is once more a green and flourishing science.² The anatomist carries a steadily increasing load. The surgeon, embarking on hitherto undreamed-of ventures; the clinician, guiding himself by physical indications involving the most delicate structural discrimination; the physiologist, the pharmacologist, the pathologist,—all lean upon him. With an eye to varied uses, the student must gain a picture of the body as a working whole; of its parts, taken severally and in their relations; and finally of the microscopic structure of tissues and organs. The teacher of anatomy may take one of two roads. He may attempt to forecast literally the special requirements of each of the above branches, confining his instruc-

¹ "For over six hundred years there has been at least some practical instruction in anatomy, and for over three hundred years there have existed anatomical laboratories for purposes of teaching and investigation, although only those constructed during the present century (nineteenth) meet our ideas of what an anatomical laboratory should be." Welch: *The Evolution of Modern Scientific Laboratories: an Address delivered at the Opening of the William Pepper Laboratory, University of Pennsylvania*, Dec. 4, 1895.

² For an extremely readable account of the development of the science and teaching of anatomy, see "Anatomy in America," by C. R. Bardeen, *Bulletin of the University of Wisconsin*, no. 115.

tion to the indispensably useful thus arrived at; or he may handle his subject freely—not unmindful of its practical value, but with broad scientific background and sympathy. It needs no argument at this point to vindicate the latter policy. Dissection has therefore ceased to be synonymous with anatomy; for no one way of looking at or of dealing with the cadaver will enable the student to grasp even its gross structure. It is one thing to take the body to pieces; it is something else to conceive these severed and dissociated elements in stereoscopic relation; and it is a still further task to unravel the tissues themselves: hence, on the macroscopic side, the prominence now given to reconstruction through drawing and modeling, and the close study of charts and of cross-sections, of models and of special preparations that form the indispensable teaching museum. Courses in histology and embryology, closely correlated with gross anatomy, furnish the accompanying microscopical discipline. Something like one-fifth of all the available time of the entire medical curriculum¹ is commonly absorbed by the various branches constituting a modern department of anatomy. How much of this may be profitably spent in the lecture-room is yet under discussion. It needs perhaps still to be emphasized that description is no substitute for tactile and visual experience, and that such experience, if intelligently controlled, both records and organizes itself with surprisingly little formal revamping.

Outside of anatomy, the laboratory method in medicine is considerably less than a century old. Its rapid spread has been in conservative quarters decried as a fad; but the facts suggest a nobler view. For the century which has developed medical laboratories has seen the death-rate reduced by one-half and the average expectation of life increased by ten or twelve years.² Of these laboratories, physiology had the first, that of Purkinje, at Breslau, established in 1824. In general, the experimental physiologist has proceeded upon the hypothesis that physiology is the physics and chemistry of living matter. He employs the apparatus and procedure of the physical laboratory to study the mechanical properties of tissue and the physical conditions to which these properties respond. The mechanism of the nervous system, the circulation, respiration, assimilation, muscular activity, lend themselves more or less readily to description and interpretation from the physical point of view. The apparatus and procedure of the chemical laboratory have been brought to bear in the analysis of bodily tissues, fluids, and secretions, and in the experimental reproduction of digestive and other processes. Not infrequently the subject is presented in two divisions, the former called physiology, the latter physiological- or bio-chemistry. That the mechanical standpoint has richly justified itself is indisputable; nevertheless, so far as concerns medical education, it is not yet ready wholly to absorb the functional point of view. An unbridged gap exists. Whether the physical sciences will ever so far refine their procedure as altogether to resolve function in mechanical

¹ Between 3600 and 4000 hours of instruction make up the entire curriculum.

² Welch: *University of Chicago Record*, vol. xii., no. 3, p. 79.

terms, it is needless here to discuss. Such an outcome is at any rate more distant than the early investigators, in the first flush of their splendid successes, supposed:

*"For long the way appears which seemed so short
To the less practised eye of early youth."*

Meanwhile, whatever its limitations, the physiological laboratory is of immense educational importance to the prospective physician. Physiology is, in a sense, the central discipline of the medical school.¹ It is the business of the physician to restore normal functioning: normal functioning is thus his starting-point in thought, his goal in action. The physiological laboratory enables the beginner to observe the functions of the body in operation and to ascertain how they are affected by varying conditions, —a wholesome discipline for two reasons: it banishes from his mind metaphysical principles, such as vital force, depression, etc.; it tends, in exhibiting the infinite subtlety and complexity of the physiological mechanism, to emphasize normal conditions rather than medication as ultimately responsible for its orderly working. The student who has been successfully trained to regard the body as an infinitely complex machine learns to doubt his capacity to mend it summarily. It is true he lacks time to master any considerable part of the field which experimentation has covered from this point of view; but characteristic and pregnant illustrations at least insure his sanity. He may do ever so little, yet for that little he cannot take anyone's word. His actual contact with facts puts him squarely on his feet and cures him once for all of mystical and empiric vagaries.

Anatomy and physiology form but the vestibule of medical education. They teach the normal structure of the body, the normal function of the parts, fluids, organs, and the conditions under which they operate. The next step carries the student *in medias res*; he begins pharmacology,² —the experimental study of the response of the body to medication.

The science got its problem in the first place from the credulity of which the traditional pharmacopoeia is the encyclopedic expression. It undertook to question the complacency and vagueness of the empiric. How far was his reliance upon specific agents justified? If at all, was it possible to ascertain the source of their efficiency and its limits?

Pharmacology was thus originally negative and critical. It rapidly pruned away exaggeration and superstition, leaving, however, a vigorous growth behind. It ascertained, for example, that quinine was administered in vain nine times out of ten; but that in the single condition in which it was applicable—malaria—it struck at the root of the disease by actually destroying in the blood the obnoxious parasite. The limits of the effectiveness of digitalis, atropine, strychnine, have been discovered and explained; and similarly, the utter uselessness of dozens of concoctions with which

¹About 450 hours of instruction are devoted to it on the average, in the best schools.

²The first laboratory of experimental pharmacology was that of Rudolph Buchheim in Dorpat, 1840.

the digestive capacity of the race has long been taxed. Intelligence has thus been introduced into a realm for ages unguardedly open to ignorance and recklessness.

The science did not long remain merely critical: the development of chemistry and experimental physiology created a positive opportunity. Given, in a word, this or that condition,—a disease, a symptom, or pain itself,—cannot an agent be devised capable of combating it? Cocaine, the antipyretics, the various glandular preparations, and serum therapy are among the affirmative replies that witness the constructive possibilities of pharmacodynamics. The strictly experimental science, thus richly rewarded, has reinforced physiological conceptions independently at work in the effort to rationalize materia medica and therapeutics. Instead of naïve reliance upon poly-pharmacy, diseases and their attendant symptoms have now been divided into some half-dozen provisional classes, subject to continuous revision, according to the method of attack to which they are at the moment most accessible. There are those that drugs actually combat,—syphilis and malaria, for example; next, the self-limited diseases, in the course of which therapeutic measures may be used to avert dangerous symptomatic consequences,—as bathing reduces the temperature in typhoid, as chloroform checks convulsions in strychnine poisoning, as morphine relieves mere pain. There are those in which the body's natural methods of defense may be hastened or strengthened, as through serum therapy; those in which our only reliance thus far is on environment or suggestion; and finally, those in which summary relief may be had through the surgeon. A great change, this, from indiscriminate and largely ignorant dosing! The body diseased is indeed like a city besieged. No single form of military manoeuvre can be prescribed as a sure defense; now a sally from the main gate discomfits the enemy; again, a diversion from some unexpected quarter; sometimes the inhabitants conserve their strength in the hope of wearing the enemy out, feeding the soldiers at the expense of all the others; and sometimes, as in tuberculosis, there is no hope except by actually decamping, leaving a vacant Moscow to a cheated foe.

In the university, pharmacology has critically an extensive, creatively an apparently boundless, opportunity. The medical student can at best browse the field here and there. But as was found to be the case with experimental physiology, he cannot forego that opportunity, limited though it be. The young doctor's therapeutic environment is still distinctly unfavorable. He is exposed to danger, front and rear. The traditions of the profession are in the main crudely empiric; they embody a "pop-gun pharmacy, hitting now the malady and again the patient, the doctor himself not knowing which."¹ Besides, the practitioner is subjected, year in, year out, to the steady bombardment of the unscrupulous manufacturer, persuasive to the uncritical, on the principle that "what I tell you three times is true."² Against bad

¹ Osler, *Aequanimitas*, p. 127.

² "On a basis of 5000 prescriptions examined, 47 per cent are for proprietary medicines." M. G. Motter, in *Bull. Amer. Acad. Med.*, vol. ix., no. 1.

example and persistent asseveration, only precise scientific concepts and a critical appreciation of the nature and limits of actual demonstration can protect the young physician. The laity has in this matter more to fear from credulous doctors than from advertisements themselves: for a nostrum containing dangerous drugs is doubly dangerous if introduced into the household by the prescription of a physician who knows nothing of its composition and is misled as to its effect.¹ Experimental physiology and pharmacology must train the student both to doubt unwarranted claims and to be open to really authoritative suggestion: for it is equally important to reject humbug and to accept truth. Fortunately, even a brief concrete experience may teach one to be wary in weighing evidence.

The course in pharmacology need include, therefore, actual experimental determination by the student himself of the effect on animals of a relatively small number of carefully selected agents; demonstration of others by the instructor; and a critical survey of the rest by means of lectures and recitations.² *Materia medica*, now much shrunken, need concern itself only with the pharmaceutical side, aiming to familiarize the student with drugs of proved power and the most agreeable and effective forms in which these may be administered. Therapeutics subsequently adds to these agents whatever other resources the clinician has accumulated,—baths, electricity, massage, psychic suggestion, dietetics, etc.,—approaching the subject from the standpoint of disease, as opposed to the pharmacological approach from the standpoint of the drug itself.

The last division of the medical sciences—and the most extensive—includes pathology and bacteriology. The three subdivisions of pathology are symmetrical with anatomy, physiology, and physiological chemistry. To the first corresponds pathological anatomy; to the second, pathological physiology; to the third, chemical pathology.

In its modern form the study began on a comprehensive basis when Virchow, called from Würzburg, established the first pathological institute in Berlin in 1856. His plans went far beyond the gross morbid anatomy then current. He conceived pathology not only as a descriptive but as an experimental science, whose laws are the laws of general biology. The pathological is not, in this view, an anarchic, extra-legal freak; it is the product of agencies and forces, operating on regular and inevitable lines. The problem of the pathologist is through observation and experiment to get the key to the pathological process, in order that he may understand its origin and significance, and, if necessary, avert or control it. The pathological is abnormal from the standpoint, not of biological law, but of the human interests that it sometimes thwarts—sometimes, only; for not infrequently it is a beneficent, compensa-

¹See *The Propaganda for Reform in Proprietary Medicines*, published by the American Medical Association, Chicago, Ill.

²On the average, about 160 hours are devoted to instruction in pharmacology; something more than half of these can be given to the laboratory, the remainder to recitations.

tory adjustment, actually favorable to the individual. Experimental pathology has developed along both biological and chemical lines: the former, accentuating the life-history of the abnormal growth, the latter, endeavoring to trace back the changes observed to the chemical activities involved in the life-process. Somewhat recently, a shifting of emphasis has made the physiological point of view more prominent,—a wholesome development, medically speaking. The physician is constantly in contact with disease processes that he is unable to correlate with the accompanying structural modifications. Occasionally the surgeon throws a stream of light upon such a situation; too often, all is dark until the autopsy reveals the truth. Pathological physiology aims to study structural change from the standpoint of function. It asks primarily not what is the history of the structural modification itself, but what are its progressive consequences to the functional routine of the organism. It reproduces disease experimentally, interrupting its course at significant stages, in order, having observed the functional disturbance, to ascertain exactly the structural readjustment that corresponds. "In animals," says Professor Hektoen, "the course of disease may be cut short at any time for the purpose of investigation. The disease may be studied in all its phases. Comparative pathology became the refuge of the investigator, blocked by the necessary restrictions governing the study of human diseases. The great influence of the comparative method is shown in the relatively advanced state of our knowledge in regard to human diseases readily communicable to animals, as compared with our ignorance in regard to other human diseases which, so far as we know, are not transferable to animals."¹ For the prospective physician the value of such a course depends, of course, on the opportunity to compare the laboratory findings with the symptoms shown by patients in the hospital wards.

In general, the effective teaching of pathology is dependent on ease and frequency of access to the autopsy-room. It would be difficult just now to over-emphasize that point. We shall soon see that the post-mortem is in this country relatively rare and precarious; that not infrequently pathological courses are organized and given whose illustrative material is limited to models, to a small number of preserved specimens, or even to bits of material already cut into microscopic sections or just lacking that last touch. Such instruction may do justice to the subject on the histological side, but it leaves much to the already overburdened third and fourth years. And it is surely a serious disadvantage to the teacher of pathology to find himself year after year teaching the subject without access to the post-mortem room.

Specimens alone—whether gross or microscopic—are inadequate for several reasons. In the first place, gross fresh specimens are too perishable: they change quickly after removal from the body and in consequence of handling during transportation; refrigeration avoids softening and putrefaction only at the cost of destroying the blood,—a most important link in the chain. More important still, however, is the consideration that disease is not an affair of a single organ or tissue, still less, of a

¹ *Congress of Arts and Sciences*, vol. vi. pp. 112, 113 (slightly abridged).

microscopic portion of such organ or tissue. Even an acute disease—pneumonia, diphtheria—involves the body as a whole; chronic defects—such as heart lesion or cancer—affect the organism likewise in its entire extent. The pathologist, then, seeking to convey to the student an objective conception of the nature and effects of disease as a process, needs the entire body in order to do so. Pathology is taught for that purpose; it fails of its object just so far as the lack of autopsies makes it impossible. Cancer, for example, is not a local disturbance involving this or that organ. The student who is expected to grasp its character cannot do so if all he does is to see a cross-section put up in gelatine, or to handle a papier-maché reproduction, or to observe the cell changes on a small slide. These things are well enough as far as they go, but they go only a short distance. The cancerous process is complicated and extensive. Other organs, far from the original site of the disease, are involved; nay, the original site itself may be in question. The vastness of the involvements, the relationships of affected locations to each other, the response of the bodily mechanism fighting to achieve a readjustment—only the autopsy can disclose these; and without them, the student cannot attain an intelligent conception of the subject he is studying.

Pathology's greatest contribution to the comprehension and mastery of disease has been by way of illuminating its causation,—or etiology. The student who is to comprehend the significance of disease must not only make the inventory of results disclosed by the post-mortem: he should be allowed to observe the process from the very start. To this end, a demonstrative course, using living animals, must be provided. Tuberculosis, for example, should be exhibited through the inoculation of a few guinea pigs with different varieties of the tubercle bacilli, showing the various ways in which the bacilli enter and are distributed, and the variety of lesions that they produce.

We thus cross the threshold of still another science, bacteriology, developed in late years in close sympathy with pathology. It presents the same two sides,—biological and chemical; the former investigating the life-history of the microscopic organism, the latter isolating and resolving its toxic or other products. The search of the pathologist for the original causation of abnormal structural change has been immensely facilitated by the bacteriologist. He can now account for as well as describe the ravaged tissues that mark the path of a diphtheritic, typhoid, or tuberculous infection. Out of the life-history of the parasites in question has sprung the serum therapy, which has already stripped tetanus, diphtheria, and meningitis of much of their horror.

Perhaps even more important than its services to curative, have been the suggestions of bacteriology to preventive, medicine. It is hardly too much to say that modern hygiene, largely the outcome of bacteriology, has elevated the physician from a mainly personal to a mainly social status. Directly or indirectly, disease has been found to depend largely on unpropitious environment. A bad water-supply, defective

drainage, impure food, unfavorable occupational surroundings,—matters, all of them, for social regulation,—at once harbor our parasitic enemies and reduce our powers of resisting them. To the intelligent and conscientious physician, a typhoid patient is not only a case, but a warning: his office it is equally to heal the sick and to protect the well. The public health laboratory belongs, then, under the wing of the medical school. It is the clearing-house into which data from an entire state should pour. Tax-supported institutions are most favorably circumstanced in this respect. The material which they readily accumulate is at once a basis for teaching, for investigation, and for practical sanitation. Thus the laboratory sciences all culminate and come together in the hygienic laboratory; out of which emerges the young physician, equipped with sound views as to the nature, causation, spread, prevention, and cure of disease, and with an exalted conception of his own duty to promote social conditions that conduce to physical well-being.

From the standpoint of medical education, a detached academic or scientific treatment of pathology and bacteriology would sacrifice needlessly much of their value. Both subjects are, indeed, full-grown biological sciences,—university subjects, capable of cultivation only in special laboratories, closely affiliated with general biology and chemistry. But the medical student in the brief five hundred hours which he can at most secure for them gains the clearest insight into their philosophy and their bearing by following out their principles mainly in the small group of phenomena illustrated in human disease. Experimental pathology concerns him because it enables him later to conceive his clinical problems intelligently. From an early hour in his pathological work, the student may then begin in the autopsy-room to saturate himself with the clinical spirit. This is not to be confused with the premature “cutting” or the impatient “prescribing” to which the old-fashioned medical student was addicted. “Cutting” and “prescribing” may still be two years distant; but meanwhile it is both possible and “important to keep ever before the student the part which the work he is doing plays in leading to a more complete comprehension of disease.”¹

One closes a brief review of the medical sciences with a feeling akin to dismay. So much remains to find out, so much is already known,—how futile to orient the student from either standpoint! Practically, however, there is no ground for despair. Enough can be achieved to give him precise conceptions in each of the realms touched upon; and the actual value of these conceptions and of the habits grounded on them depends less on the extent of his acquisitions than on his sense of their reality.² Didactic information, like mere hearsay, leaves this sense pale and ineffective; a first-

¹ Report of Committee on Pathology, Council on Education, Amer. Med. Assn., *Bulletin of Amer. Med. Assn.*, Sept. 15, 1909, p. 47.

² That method rather than any particular content is the very essence of scientific discipline is admirably pointed out by Professor Dewey in his address “Science as Subject-matter and as Method,” *Sciences*, xxxi., no. 787, p. 192. “Science has been taught too much as an accumulation of ready-made material, with which students are to be made familiar, not enough as a method of thinking, an attitude of mind, after the pattern of which mental habits are to be transformed.”

hand experience, be it ever so fragmentary, renders it vivid. After a strenuous laboratory discipline, the student will still be ignorant of many things, but at any rate he will respect facts: he will have learned how to obtain them and what to do with them when he has them.

NOTE

For the details of a course of study, framed on the lines above described, the reader is referred to the following:

A. GENERAL

1. Report of Curriculum Committee, Council on Education, American Medical Association, *Bulletin of the Amer. Med. Assn.*, September, 1909.
2. *What Constitutes a Medical Curriculum?* Issued by Association of American Medical Colleges.
3. COLWELL, N. P.: In *Bulletin of American Academy of Medicine*, vol. x., no. 3.
4. BILLROTH, T.: *Ueber Lehren und Lernen in Medicin.*
5. BICKEL, ADOLF: *Wie Studiert man Medizin?* (Stuttgart, 1906).

B. SPECIAL SUBJECTS

1. *Anatomy.*

- BARKER, L. F., and BARDEEN, C. R.: Outline of Course in Normal Histology and Microscopic Anatomy, *Johns Hopkins Hospital Bulletin*, vol. xii., nos. 62, 63.
- BARKER, L. F., and KYES, P.: On Teaching of Normal Anatomy of Central Nervous System to Large Classes of Medical Students, *Proc. Assn. Amer. Anat.*, 1900.
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- HUNTINGTON, G. S.: The Teaching of Anatomy, *Columbia University Bulletin*, 1898.
- KEILLER, W.: On Preservation of Subjects for Dissection, etc., *Amer. Jour. Anat.*, 1902-3, vol. ii.
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CHAPTER V

THE COURSE OF STUDY: THE LABORATORY BRANCHES

(B) FIRST AND SECOND YEARS (CONTINUED)

WITH the preceding characterization, the schools included in our first division¹ on the whole agree. They are all organic parts of full-fledged universities; their medical courses are as a rule constructed upon the basis of adequate pre-medical scientific training. In general, the laboratories of institutions upon a college basis reflect university ideals in equipment, management, and appearance.² As a rule these institutions have at least four separate laboratories, for anatomy, physiology and bio-chemistry, pharmacology, pathology and bacteriology. As their resources have grown, the departments have tended to increase by subdivision: histology, physiological chemistry, clinical pathology, bacteriology, attain departmental stature. Hygiene is especially prominent at the state universities, where effective departments of public health bring the laboratories of pathology and bacteriology into fruitful relation with local authorities and the local profession throughout the state; and endowed schools are making determined efforts to develop departments of preventive medicine. In some cases abundant, in several others increasing, facilities are offered in all branches for both teaching and research; and teaching and research permeate each other. The various departments, in intimate communication with each other and with the general science work of the institution, are officered each by its own full-time professor, in most instances with a more or less satisfactory corps of paid assistants. Within these active hives of scientific interest a thoroughly charming relation prevails: a vigorous, stimulating, and appreciative chief, on the one hand, enjoying the cooperation of enthusiastic young disciples on the other. It is difficult to realize that so substantial an organization is so recent,—hardly more than a half-century old in Germany, less than twenty years old in America. In this brief period the earlier subordinates have themselves become departmental heads in their own schools, or have gone forth to found or to reconstruct distant institutions. Laboratories have increased in number so rapidly that the rewards of early promise or of early performance have been alike great and prompt. It is unlikely that this pace will permanently keep up.

In anatomy and physiology it occasionally occurs that the departmental head is not himself a graduate in medicine.³ This innovation arises out of a dual motive: it

¹ i. e., those requiring for entrance two or more years of college work; a list of them is given on page 98.

² A few of these, formerly on a lower basis, have elevated their entrance requirements, while leaving facilities as they were. Several schools are pledged to higher entrance requirements, though quite unable to improve their facilities. Indeed, as higher standards mean fewer students and reduced income, their facilities may suffer deterioration.

³ Occasionally the dean of a medical school is a non-medical man. In such cases it is extremely important that he be in close sympathy with the clinical side and well acquainted with modern developments in clinical teaching. Even more dangerous is the expedient of making a professor in the academic department dean of the medical department.

represents a reaction from the superficial methods of the practitioner professor, as well as a realization of the essential continuity of medical with biological science. The non-medical professor is not necessarily indifferent to explicit medical reference; his department need not lack sympathy with medicine merely because he has no M.D. degree; and his disinterested attitude is in any event indispensable. But the experiment is not free from danger, and its outcome will be watched with interest. Meanwhile, there is no question that these posts cannot be satisfactorily filled by active physicians. The practitioner usually lacks impartial and eager scientific spirit; he can at best give set hours to teaching, and these are not infrequently interrupted by a patient's superior claim; of course he has little or no time and rarely any zest for research. Western Reserve and the New York City department of Cornell, alone of schools of this rank, continue an active surgeon in the chair of anatomy.

Of the twenty-five institutions either now, or by the fall of 1910 to be, on the two-year college basis, or more, fourteen¹ offer the entire four-year course in one organized institution; five² are divided, offering the laboratory branches in one place and the clinical branches, more or less independently organized, in another, sometimes close by, at other times widely separated; six³ are half-schools, offering only the work of the first and second years. The complete school in touch with the rest of the university represents the normal and correct form. The study of medicine must center around disease in concrete, individual forms. The ease with which the clinics and the laboratories may there illuminate each other is an incontestable advantage to both. It is difficult to imagine effective teaching of pathology, for example, under conditions where the operating-room, the medical clinic, and the autopsy do not constantly contribute specimens and propound queries to the laboratory; and assuredly the teaching of medicine and surgery cannot proceed intelligently without constant intercourse with the laboratories. Any disintegration of hospitals and laboratories is harmful to both,—and to the student, in shaping whom they must cooperate. So important is organic wholeness that the remote department, if entire, is from all points of view preferable to division. The initial difficulty—that of sharing the university ideals—may be met by liberal provision for intercourse with the academic body and by redoubled efforts to maintain creative activity, as Cornell, for example, has done at New York. Fortunately, our needs in respect to medical

¹Johns Hopkins, Harvard, Western Reserve, Minnesota, Cornell (New York City department), Yale, Michigan, Indiana (Indianapolis department), Iowa, Pennsylvania, Syracuse, Columbia, Dartmouth, Colorado. Of these, two are not located in the same town as the university,—Cornell (New York City), Indiana (Indianapolis).

²Rush Medical College (of which, though both parts are in Chicago, the first two years belong to the University of Chicago, and the last two, given elsewhere in the city, are only affiliated with it), California (first and second years at Berkeley, third and fourth at San Francisco and Los Angeles), Nebraska (first and second years at Lincoln, third and fourth at Omaha), Kansas (first and second years at Lawrence, third and fourth at Rosedale), Stanford (first and second years at Palo Alto, third and fourth at San Francisco).

³Wisconsin, Missouri, South Dakota, North Dakota, Utah, Wake Forest. Cornell repeats the first year at Ithaca; Indiana duplicates the first and second years at Bloomington.

schools can be met without considerable resort to either the divided or the remote department.¹

The divided school begins by inheriting a serious problem. Its laboratory end, situated at the university, has been recently constituted of modern men; the clinical end, situated in a city at some distance, is usually what is left of the old-fashioned school which the university adopted in taking on its medical department.² In such cases, there are practically two schools with a formal connection; such is essentially the situation in California, Kansas, and Nebraska. In course of time these clinical faculties will be reconstituted of men of more modern stamp. But the separation of the clinical branch, with the increasing absorption of the teachers in practice, involves constant danger of fresh alienation. The clinical professor of the university is very apt to be a busy physician; and if so, pedagogical and scientific ideals are all the more easily crowded into a narrow corner, when he does not breathe the bracing atmosphere of adjacent laboratories. In time, a more exacting pedagogical code and increased sensitiveness to real scientific distinction may to some extent correct the tendency. Meanwhile, these institutions, so long as they continue, require much more vigorous administrative supervision than they have anywhere received. A dean, moving freely between the two branches, and frequent opportunities for social and scientific intercourse between scientific and clinical faculties, may throw a more or less unsteady bridge across the gap. But there is little reason to believe that the divided school will ever function as an organic whole, though it may be tolerable as a halfway stage on the road from the proprietary school to the complete university department. "I cannot help wondering," said President Pritchett,³ "how it would affect the pedagogic and professional ideals of an engineering school if its first two years were given in one place and the last two years in a place two hundred miles away. My impression is that there would be two separate schools with very little more reaction, the one upon the other, than exists between any other two schools so located." Thus far the difficulty seems hardly to have been suspected: the dean of Nebraska at Lincoln is a busy professor who has no real hold on the clinical men at Omaha; the dean of California is superintendent of the hospital in San Francisco, with no real control of what goes on at Berkeley, and surely without any possible control over the second clinical department at Los Angeles; Kansas practically accepts the split by setting up a dean at each of the two ends, though they are only an hour and a half apart; Mississippi, with even better reason, does the same, for the journey from Oxford to Vicksburg, not great when measured in miles, takes the better part of a day even if one is lucky enough to make the necessary railroad connections.

The problem of the half-school is different. The two-year school originated in ✓

¹ See chapter ix.

² In a measure, also still true of some of the complete schools; but the constant contact of laboratory and clinical men tends gradually to bring the edges together.

³ Address: "The Obligations of the University to Medical Education," before Council on Education, American Medical Association, Feb. 28, 1910 (*Journal A. M. A.*, vol. liv. p. 1109).

institutional expediency; but it may prove of actual pedagogical importance. When Columbia and Michigan arranged that the four years of the A.B. course might contain two years of the M.D. course, institutions lacking medical departments were impelled to offer just enough of the medical curriculum to meet the competition. The half-school thus avoids loss of time to the student and loss of students to the university. The arrangement took advantage of the break in the middle between the laboratory and the clinical years; but a deeper reason made the experiment feasible.

The bachelor's course has under modern conditions a double aim: it is simultaneously cultural and vocational. The sciences fundamental to medicine have obviously both characters: they are vocational to the extent that they are instrumentally indispensable; they are cultural, as is all enlarging and releasing experience, whether of men, books, or travel. Culture is indeed in this aspect an incidental value of all novel experience. So far, then, the combined course may be fairly said to be feasible, because it enriches the college curriculum; and the college may do well to offer the opportunity.

Is the scheme equally sound from the standpoint of medical education? The professional and cultural standpoints, though obviously overlapping, are not identical. The professional purpose involves greater concentration, is on the lookout for definite correlations, and steers towards an evident practical goal. The medical curriculum possesses a certain organic unity in virtue of the fact that each of its parts does this same thing. The college as college is indifferent to the ultimate practical bearing; the medical school cannot afford to forget it. As to certain subjects, indeed, there is perhaps little to choose. The college has already taken chemistry wholly out of the medical curriculum; it may be allowed to take bio-chemistry, too. In reference, however, to other subjects, pathology, physiology, etc., it is important—once more from the standpoint of medical education—to distinguish between two forms which the combined course assumes. To take advantage of it at Columbia or Michigan—complete four-year schools—the student goes over into the medical department, which is compactly organized with laboratories and clinics interwoven. He spends the entire period of four years there. The college has nothing to do with it beyond registering his credits for the first two years towards his A.B. degree. That fact makes absolutely no difference to the medical teachers. The student is trained for four years just as he would be trained if he had his A.B. degree to start with. The combined course in this form exacts no sacrifice from the medical school.

In the case of the half-school or the divided school the situation is different: the medical subjects are apt to be parceled out among the general scientific laboratories, and there are no clinics or clinicians at all. The professors themselves may lack medical training. There is no observable goal to steady or beckon the teacher.¹ Counting

¹The medical department of the University of Wisconsin, a half-school, combats the difficulty by appointing a professor of clinical medicine.

the two years' work as the latter half of the A.B. course may, under these circumstances, distinctly weaken it from the medical standpoint. It is, of course, true that the German medical schools are without the sort of organization we are now emphasizing; but they have what we lack, ideals and traditions. Dispersion does not cost them their point of view. When our ideals are as sound, we too may be capable of dispensing with a more or less formal organization. Some of our schools may already be.¹ Would it, however, be equally safe even in Germany, if there were no clinics at all?

Take, for instance, the subject of pathology. The two-year school, remote from hospitals and autopsies, can provide museum specimens, models, and microscopic mounts. Under favorable conditions, animal experimentation can still further supplement its resources. But the pathologist will suffer from isolation; he is part of the college, but not part of a hospital, and what is hurtful to him cannot be helpful to his students. For them much depends on the arrangement of courses in the institution to which they emigrate for their third and fourth years. Meanwhile, in any case, at the fateful moment of their introduction to the subject, however admirably they may have been drilled in the specific content of the course, little advantage can be taken of their general absorptive power. For even a fair student, while learning his lessons in pathological histology, might assimilate incidentally much that goes beyond. Not infrequently what is most stimulating in his experience would be thus obtained. It would appear, then, that, while the college will surely gain, it is not certain that the medical curriculum may not lose when the first and second years are separated or detached.

There would be the less necessity for the cautious attitude here taken in reference to the two-year school if these departments were everywhere organized, as they have been by Wisconsin, Cornell, Missouri, and Indiana, with a keen appreciation of the difficulties to be surmounted and with financial resources capable of coping with them. Apparatus, books, animals, laboratory material, must be provided in abundance. In the institutions above mentioned they are. Too frequently, however, apparatus is limited, books are scarce, animals hard to get, running expenses reduced to a mere pittance. Skilled assistants and competent helpers may also be lacking. The teachers are young and well trained; but their professorial salaries are paid to them in part for menial labor. They care for apparatus, get it out, put it away, prepare all demonstrations and experiments, and clean up after class. Be the students ever so few, routine drudgery and isolation will wear out the enthusiasm of their instructors. The men will grow stale, the department sterile. As the two-year schools now generally require two years of college work for entrance, they cannot be parsimoniously organized. Yet their rapid spread seems to indicate a mistaken notion that the laboratory years can safely be conducted on a small scale at comparatively slight expense.

¹ For an extremely lucid and able discussion from this point of view see the *Harvard Bulletin*, Nov. 3, 1909: "Education in Medicine: The Relations of the Medical School to the College."

A uniform or fixed apportionment between various subjects is in schools of the highest grade neither feasible nor desirable. The endeavor to improve medical education through iron-clad prescription of curriculum or hours is a wholly mistaken effort; while mechanical regulation cannot essentially improve the poorer schools, it may very seriously hamper competent institutions. There is no one way to study medicine, still less one way to advance it. If the teaching is in inferior hands, printed directions will not save it. The prescribed curriculum is a staff upon which those lean who have not strength to walk alone.

Fortunately, current practice varies widely. The Johns Hopkins, for example, offers 700 hours' instruction in anatomy, of which about 400 are required, Harvard 427; Rush gives 108 hours to histology, Cornell 265; Columbia requires 490 hours in anatomy, embryology, and histology; Harvard gives 513 hours to pathology, Western Reserve 304. These discrepancies are of slight importance, for the medical curriculum is throughout constituted of overlapping parts: apparent deficiencies in one subject are supplied in another. Physiology revises and mends anatomy, and the clinical years may be safely relied on to build out here and there the details of pathology. A certain carefully selected, irreducible minimum in each subject must of course be common throughout these institutions; the rest may be left open, to vary from school to school, and within each school to vary to some extent with different individuals. The medical school is above collegiate grade; it is a professional school on a college basis. Its students are presumably mature and will doubtless prove increasingly well trained. They are fit to be trusted with a certain degree of discretion, in a field within which selection between alternatives of equal importance must in any event take place. The fourth year at Harvard is left open to choice; at Johns Hopkins one-fourth of each year is subject to election; intensive study at certain points is encouraged without endangering the fundamentals common to all. The problem of medical education and orientation is not otherwise manageable. In the effort to force every important subject as it has developed into the common curriculum—be it ever so inadequately—the average curriculum now calls for something like 4000 hours of prescribed work. The demand is an impossible one.¹ It originates partly in the effort to make the medical school repair the omissions of preliminary education; higher standards will relegate something at least to the high school and college, and so far relieve congestion. As for the rest, we require a modified conception of what any sort of school can and ought to attempt. The mature student, competently guided, needs not to be policed like the "breeching scholar in the schools." His every moment must not be preempted by an assigned task. Von Strümpell rebukes the same tendency in Germany: "Somewhat more rarely in the first, very often, however, in the later semesters, many students hear lectures for eight to ten hours a day. From morning to night their time is taken up with classes; they rush out of one lecture hall into another, hearing a huge mass of facts and theories put forward. One can readily imagine the condition inside their

¹ A large percentage of students are making up preliminary "conditions" besides.

heads by the time night comes. The actual outcome of this absurd overcrowding is that only a small amount of what is heard is retained. One can profitably listen only when one can take in readily and follow up systematically with work at home."¹

The maturity of the student body at this level makes possible another innovation. The low standard or immature type of medical student must have his medical knowledge carefully administered in homeopathic doses. He carries a half-dozen studies simultaneously because his untutored interest fatigues easily and his assimilative ability in any one direction is relatively slight. Time and energy are of course lost in hourly breaking off one connection and making another. But it is unavoidable; the practitioner teacher must leave at the close of his "hour" anyhow. At the university studies may be concentrated. The laboratories are open all day; the professors are there at work.² The first months of the medical curriculum are then given over to anatomy alone; for it is clearly illogical to begin even physiology till the anatomist has made some headway. Concentration³ is economical of time and energy, and stimulates the student to push on beyond definitely prescribed limits. How far it can wisely be carried is a point to be determined by experiment.

The schools of our second division—those requiring for admission high school graduation or the "equivalent"—move within narrower limits. Two factors are at work. Most schools of this class live on their fees; McGill, Toronto, Tulane, are among the few that are enabled by additional resources to provide a complete laboratory outfit. The strongest of the others, Jefferson and Northwestern University, for example, relying practically altogether on income from students, can at best develop highly a department or two;⁴ the rest are necessarily restricted. The quality of the student body is likewise a limitation. Laboratory courses, following the lines that we have marked out, are impossible to boys whose preliminary training in science has barely begun. At best the students have an elementary acquaintance with physics or chemistry; frequently not even that. Those that have and those that have not sit side by side on the same benches. A difficult dilemma is thus presented. It is impossible to teach the medical without the pre-medical sciences; the medical course, already crowded, cannot be either cut or compressed sufficiently to accommodate them. The situation cannot, therefore, be wholly retrieved within the medical school. Makeshifts vary somewhat from school to school. A rigid medical curriculum, clipped to the quick, leaves perhaps a few hundred hours available for pre-medical work. Chemistry as a rule absorbs them all; nothing is attempted in biology; occasionally physics gets a slight opportunity, as at Tulane, where first-year students hear one lecture a week,

¹ *Ueber den Medizinisch-Klinischen Unterricht*, p. 11 (Leipzig, 1901). To the same effect, Professor T. Clifford Albutt: *On Professional Education*, p. 49 (Macmillan, 1906).

² "Die Studierenden sollen jederzeit eintreten dürfen," Virchow's laboratory motto, quoted by Orth: *Berliner Med. Week. Sch.* vol. xliii. p. 890.

³ See "The Concentration Plan of Teaching Medicine," by H. A. Christian, *Proceed. Assn. Amer. Med. Colleges*, March, 1910.

⁴ See p. 133.

"abundantly illustrated," or at St. Louis University, where sixty-four hours of didactic instruction are devoted to the subject.¹

After all, however, there are different ways of meeting even a desperate condition; and in this instance the variations are within limits amazingly wide.² There are schools that sink ignominiously without a struggle; others that take advantage of the student's plight to palm off cheap instruction at a profit; and a small number that by valiant effort minimize, and to no slight degree surmount, the difficulty. According as an institution reacts in one or another of these ways, we make out three main varieties among schools on the high school basis:

1. Those that by careful selection of students and extraordinary pains in teaching make the very most of the situation;
2. Those that, content to operate on a lower plane, are still commercially effective;
3. Those that are frankly mercenary.

We shall briefly consider these three types in succession.

(1) These schools form a small minority. They are straining hard to get from the high school to the college basis; in equipment, organization, and scientific spirit they are to greater or less degree already there. They have usually four scientific departments,³ already in most instances well equipped, each in charge of a full-time professor, for whom private quarters and more or less free time⁴ procure some opportunity to push ahead. Energy, sincerity, and intelligence are abundantly in evidence throughout these institutions. In resources they vary greatly, but in spirit they are alike; and all are admirable. Every possible point is scored: the more difficult the contest, the keener the play. However scant the resources, something is put into books; however hard pressed the instructor, a museum, carefully catalogued and labeled, has been painfully assembled.

Of schools of this type, two Canadian institutions—McGill and Toronto—deserve especial attention. In point of laboratory equipment they equal Minnesota and Michigan; their lower entrance requirement, minimized by conscientious adherence to a strict interpretation of their announced standards, is now compensated by the addition of a fifth year to the curriculum.⁵ At Toronto the teaching is wholly in

¹Sometimes the provision is sheer make-believe. At Denver and Gross College of Medicine (Denver, Col.) the physics is thus described: "One hour each week in practical chemistry as applied to medicine. The first year's work will include medical physics, chemic philosophy, and organic compounds." *Catalogue, 1908-9*, p. 22.

²See table at close of this chapter.

³Anatomy, chemistry, physiology (including pharmacology), pathology (including bacteriology and hygiene).

⁴How much, depends on the quality of the assistants furnished. There is great variation in this respect.

⁵This is a very different thing from adding a year devoted to pre-medical sciences taught by the medical faculty of a proprietary school,—a makeshift without possibility of development. The Canadian year is a year in the university, where teachers of science are in position to do their subjects justice; eventually a second year will be demanded. The optional fifth year offered by our proprietary schools is commercially profitable and educationally futile. See page 47.

charge of full-time instructors, for whose original work splendid provision has been made in laboratories of ideal construction and admirable equipment. McGill is in respect to full-time teachers somewhat less fortunate; but its great museum, recently much damaged by fire, proves that genuine enthusiasm may succeed contrary to all the established rules of the game. In both institutions the shortcomings of the student body, instead of excusing perfunctory work, have rather been regarded as an obstacle to be overcome, a condition to be met. The students have had little high school science: all the more reason, then, to provide excellent laboratories, skilful teachers, abundant assistants. In keeping with effective performance are their modesty and candor. The number of "greatest anatomists" and "greatest pathologists" teaching on small salaries in obscure places in the United States, and of laboratories "as good as Johns Hopkins," is nothing less than staggering. Nor is a boastful pride in mediocrity lacking even in institutions of some real merit. At Toronto and McGill one hears in the medical schools no such bravado. There they deprecate the defects, which they hasten to show for fear they may escape notice. The absence of competition¹—be it business competition between schools conducted for profit, or academic competition between endowed or tax-supported institutions, mad to "make a showing"—may perhaps be responsible for their more guarded utterance and more assured ideals.

Perhaps a dozen institutions in the United States belong with greater or less right to the category under consideration. Regard being had to the quality of the student body, to the number of full-time teachers and assistants, and to the adequacy of laboratories, museum, and library, the best of them, in respect to the first and second years, are New York University, Syracuse,² Northwestern University, Jefferson Medical College (Philadelphia), Tulane University (New Orleans), St. Louis University, the University of Texas, handicapped though some of them are in one respect or another by resources inadequate to the ambition and competency of their faculties and by a student body of somewhat uneven composition. St. Louis University affords an excellent example of a brave, uphill contest, by no means barren of result. Unable for the moment to do all it wishes, it has, like a good general, concentrated its effort at critical points. It secures a pervasive scientific atmosphere in the first two years through the intensive cultivation of anatomy and physiology. The departmental head of the former subject stipulated that his routine work be kept in close bounds; with wise liberality he has been provided with an assistant professor, a draughtsman, and a competent helper; the productive department thus created has invigorated the entire school on the laboratory side.

To the schools just described we must look for such further facilities in high-grade medical education as the country still requires. Their ideals are correct; they lack only the means; and these they have already in comparative poverty shown the ca-

¹ There are eight medical schools in British America.

² Already requiring more than four-year high school education.

capacity to use. Once the necessary resources have been bestowed upon them, the remaining task will be merely the absorption or the suppression of the various types of medical school yet to be discussed. It is surely significant that with but a single exception, these schools are also, like those of the first division, *bona-fide* university departments.

So much for the best type of medical school on the high school basis. We consider next (2) the schools that on the same basis are shrewdly and more or less outspokenly commercial. A few of them—those at Chicago, Philadelphia, and Baltimore—have accumulated extensive and, in one or two departments, elaborate plants.¹ They are on a routine level and, within the limits marked out by state board examinations, pedagogically effective. They drill their students energetically in the elements of such of the sciences as they touch at all, but the atmosphere is at best that of a successful factory. There is no free scientific spirit. The teaching of chemistry at the Medico-Chirurgical College of Philadelphia is an extreme case in point. The course is subdivided into fixed lessons, each of them so much raw material, for which the student receives a voucher, to be returned in proper shape before he can get the voucher for the succeeding task. The vouchers returned constitute an automatic record of attendance and form the basis of an oral quiz by an instructor. "The whole system is an imitation of the business system in vogue in the better organized business offices."² Mechanically admirable, no doubt; but what convincing evidence the system itself affords of the unfitness of the students for the study of modern medicine!

Two schools of this group—the Long Island College Hospital (Brooklyn) and the Albany Medical School—are closely affiliated with laboratories which provide good teaching in certain branches: the Hoagland Laboratory at Brooklyn relieves the school of histology, pathology, and bacteriology; the Bender Laboratory at Albany carries the laboratory work in the same subjects. It will be noted that physiology and pharmacology are not properly provided by either; neither are they by the school. One might suppose that the school, relieved at one point, would become more effective at another. Not at all. Both schools pay in dividends to prosperous practitioners the sums that should be used in completing their fundamental instruction.

Scientifically, then, these schools may be called inert. They rarely cultivate any research at all; their faculties are generally composed of active practitioners whose training has rarely been modern. By way of exception Louisville has four full-time professors in the fundamental branches, the Medico-Chirurgical three, Creighton one. But very rarely has the full-time teacher opportunity to work ahead. His time and energies are bespoken by heavy routine, unlightened by a competent or organized force of assistants and helpers. In general, school positions are valued as professional

¹Preëminently the Medico-Chirurgical (Philadelphia), University of Maryland and College of Physicians and Surgeons (Baltimore), and College of Physicians and Surgeons, Chicago.

²From a description by the head of the department.

³Strictly speaking, even these are not full-time men in the medical school, since they also teach in pharmacy and dental departments.

stepping-stones, not as scientific opportunities; laboratories are often slovenly and, except during class hours, entirely abandoned. Strange professorial combinations are found: anatomy and surgery, very commonly; clinical medicine and physiology, at the University of Maryland; orthopaedic surgery and pathology, at the Baltimore Medical College; medicine and pathology, at the Chicago College of Medicine and Surgery (Valparaiso University); pathology and the physical directorship of the academic department, at Bowdoin. Scientific chairs are held by non-residents at the Universities of Colorado¹ and Vermont² and at the Medical School of Maine (Bowdoin);³ and itinerant teachers, giving the same branches at several schools, are to be found in Philadelphia, New York, and Chicago. If the larger institutions under consideration chance to contain a full-time teacher, his time usually belongs equally to dental and pharmacy departments, developed as "business propositions" to keep the plant constantly going; despite the manifest incongruity, dental or pharmacy students mingle in the same classes with medical students at the Medico-Chirurgical College (Philadelphia), Temple University (Philadelphia), and the Creighton Medical College (Omaha).⁴ Occasionally a non-practising teacher will be found who is simultaneously holder of a municipal office, to which he devotes his main thought. The medical school gets the few brief hours that it pays for. Thus the non-practising professor of chemistry at the Creighton school is the city gas inspector; the professor of bacteriology at Denver and Gross is city bacteriologist,⁵ with his laboratory at the City Hall. In the few cases where a non-practising full-time professor is found,⁶ he is swamped with work; for he has as a rule only student assistants to aid him in coping with several hundred pupils utterly inexperienced in laboratory manipulation.

For many years a school of this sort was a veritable gold mine to its owners. Fees were divided outright, or invested in buildings which the faculty owned. Once in a while the income was split: a large share went to the teachers, the rest was devoted to carrying mortgaged buildings held by the trustees. These structures themselves were not infrequently erected in pursuance of business policy. Recent agitation has forced increased expenditure on buildings and equipment. The schools

¹ Anatomy, by a non-resident surgeon.

² Physiology, pathology, and hygiene.

³ Anatomy and physiology.

⁴ Likewise at University of Maryland, Valparaiso University, College of Physicians and Surgeons (Chicago), Georgetown University, College of Physicians and Surgeons (Baltimore), Baylor University, College of Physicians and Surgeons (San Francisco), Barnes (St. Louis), Starling-Ohio, University of Texas, Toledo Medical College, Medical College of the State of South Carolina, Milwaukee Medical College, College of Physicians and Surgeons (Boston), Wisconsin College of Physicians and Surgeons. Even at Harvard, dental and medical students are mixed in some classes, though it is admitted that "the Dentals don't do as well and are harder to teach." Students are admitted to the Harvard Dental School on the basis of a four-year high school education. The discrepancy is therefore considerable.

⁵ The same is true at the University of Oregon (Portland), though in this case the laboratory is in the medical college; it is also the only real laboratory there.

⁶ Physiology, College of Physicians and Surgeons (Chicago); pathology, Creighton; chemistry, Baltimore Medical College.

have been willing enough to build; but in the matter of equipment they have usually yielded as little as they could. The conclusive evidence of lack of educational conscience or pride is the general absence of a decent museum.¹ Material, of course, abounds, the expense involved is slight; but the practitioner simply will not take the trouble. The College of Physicians and Surgeons (Baltimore), Georgetown University (Washington), Long Island College Hospital (Brooklyn), the medical department of Valparaiso University, the Chicago Hahnemann, Ensworth (St. Joseph, Missouri), are among the schools that have little or nothing in the way of a museum at all. Such specimens as one meets are often putrid, rarely labeled properly, and still more rarely catalogued. But a few exceptions may be fortunately noted: the great anatomical and pathological museum at McGill has already been mentioned. To the same class belong the excellent collections made by Souchon at Tulane and by Keiller at Galveston (University of Texas). A small but beautifully mounted collection at Boston University is once more an evidence of what conscience and intelligence will achieve despite slender financial resources.

Practically the same may be said on the subject of books. The College of Physicians and Surgeons of Chicago and the Medical College of Virginia have small working libraries; but in general no funds are set aside for the purchase of books. The school grind is merrily independent of medical literature. The University of Maryland possesses indeed a large library under a separate roof, but the building was unheated when visited in midwinter, and at best it is open only two hours a day. Denver and Gross (Denver, Colorado) and the Medico-Chirurgical College of Philadelphia have limited accumulations of textbooks and cheap medical periodicals;² Long Island and Albany have no books at all. In the College of Physicians and Surgeons, Los Angeles, the word "Library" is prominently painted on a door which, on being opened, reveals a class-room innocent of a single volume. Once more it is pleasant to record exceptions: a good library, excellently administered, is to be found at Jefferson, at Buffalo, and at Galveston.

In the matter of laboratory equipment and work, our progress may be facilitated by simple elimination. None of these schools has laboratories of pharmacology; in consequence, their teaching of materia medica and therapeutics is wholly on didactic lines. Only a few of them—the Medico-Chirurgical (Philadelphia), University of Maryland (Baltimore), the College of Physicians and Surgeons, Chicago—are well equipped to do either demonstrative or experimental work in physiology; as a rule, physiology is still didactically presented with a varying amount of experimental demonstration. The general laboratory equipment is therefore limited to chemistry, anatomy, pathology, and bacteriology.

¹The Hahnemann (Philadelphia), University of Maryland (Baltimore), Oakland College of Medicine and Surgery (California), each has a small museum.

²The former behind a counter in the business office, —practically inaccessible; the latter at the College Club House.

As a rule, chemistry advances little beyond the high school level; at the best, elementary organic chemistry is included.¹ The equipment is ordinary; there is nowhere the faintest evidence of independent scientific interest, nowhere any interplay between the chemical and other laboratories. The ground covered satisfies the state board prescription, enabling the student to pass the state board examination. Nothing more is intended; the teaching is accordingly in large measure didactic and quiz drill. It cannot be otherwise; for even in the cases where sufficient desk space is provided, competent assistants are lacking. The instruction therefore quickly deteriorates into demonstration and drill.

The teaching of anatomy clings to thoroughly conventional lines. Embryology is practically unknown; osteology is taught by lectures instead of by practical methods, such as modeling, or the like; histology is relegated to pathology because the anatomical department possesses no microscopes, in the first place, and because the practitioner teacher rarely understands their use, in the second. The laboratory is a mere dissecting-room, in which the student is required to dissect part of a cadaver under the guidance of upper-class students or recent graduates. Into none of the schools mentioned have modern ideas as to the conduct of this department permeated. Well conducted anatomical laboratories are in these days clean, attractive, sweet-smelling places; the cadavers, neatly covered when not in use, are moist, thoroughly well preserved, and not repulsive even to a layman. The dissecting-rooms under discussion are rarely clean, always unattractive, and not infrequently unpleasant. They contain tables, cadavers, and a vat; usually nothing more. Not infrequently the school skeleton is defective, as at Creighton, the College of Physicians and Surgeons, Milwaukee, and at the Kansas City Hahnemann. The models, charts, cross-sections, bone-sets,² drawings, microscopes, that complete the outfit of the modern anatomist, are conspicuously absent. Large and financially prosperous schools, such as the Medico-Chirurgical (Philadelphia), the University of Maryland (Baltimore), in immediate proximity to institutions like the University of Pennsylvania and the Johns Hopkins, where the subject is properly conducted, have profited nothing by opportunities to modernize their teaching. Of course it could not be otherwise. The professor is a busy physician or surgeon. He lectures to ill prepared students for one hour a few times weekly, in a huge amphitheater, showing a bone between his

¹ The Medico-Chirurgical College of Philadelphia offers decidedly more. The instruction there occupies part of three years and requires 544 hours of work. Nothing could better illustrate our contention that, with medical students on the high school or equivalent basis, anything like a thorough treatment of the pre-medical sciences within the medical curriculum is fatal to the medical curriculum itself. Chemistry here takes up over one-eighth of the entire medical curriculum. Of course physics and biology deserve something too, though they get practically nothing. What would happen to the medical curriculum if a similar effort were made to teach them thoroughly? For the time being, the instruction limps along without them. When their necessity is generally recognized, as that of chemistry is now recognized, it will be impossible to attempt them within the medical school, and the battle for the preliminary scientific training will have been won.

² At Cornell (Ithaca) a complete set of bones is given out to each student. There are over 100 complete skeletons. This makes a striking contrast with numerous schools that do not possess a single complete skeleton.

finger-tips or eloquently describing an organ which no one but the prosector distinctly sees; at the close of which oratorical performance he snatches his hat and, amid mingled applause and cat-calls, makes for his automobile to begin his round of daily visits. In the afternoons "demonstrators" supervise the dissecting, where eight or ten inexpert boys hack away at a cadaver until it is reduced to shreds. The actual emphasis falls on the didactic teaching and the quiz-drills; something like half the student's time is spent in the lecture-room: 220 out of 450 hours at Louisville, 360 out of 684 at the College of Physicians and Surgeons (University of Illinois), Chicago. The really effective work is not infrequently done by quiz-masters, who drill hundreds of students in memorizing minute details which they would be unable to recognize if the objects were before them. This is a flourishing industry in "great medical centers" like Chicago¹ and Philadelphia.

Pathology is practically in the same condition. The best of these schools are well supplied with microscopes, microtomes, and material. But the teaching is usually uninspired routine drill. Sections are cut, stained, mounted, and observed. At the close of the year the student will perhaps have accumulated a box of several dozen slides, which he may carry home with him. But the work has been largely histological,—devoid of experimental features, on the one hand, and but feebly articulated with clinic and autopsy, on the other. The autopsy is indeed the indispensable adjunct of an effective department of pathology. "A course in pathology without autopsy work and fresh material is like a course in systematic botany without field work."² The facilities of all but a few of our best schools are in this respect unduly limited; at no other point is the lack of a hospital under school control more acutely felt. Makeshifts of various kinds are invoked by way of remedy: in New York, for example, Columbia and Cornell have attached the two coroner's physicians who serve in the autopsy-room of the great Bellevue Hospital, thus procuring fresh material from a large number of cases. The arrangement still leaves the professor of pathology himself out of account. Of the schools belonging to the class under consideration few have even fair opportunities of this character; some of them rely altogether on a friendly coroner's cursory performance in the rear room of an undertaker's establishment.³ The classes at the University of Maryland witness "perhaps ten [autopsies] a year;" the College of Physicians and Surgeons, Baltimore, describes its opportunities as "restricted;" Georgetown University (Washington) gets a "few," Hahnemann (Chicago), "four or five a year;" at Northwestern they are "scanty, the students do none;" at Cooper (San Francisco) they are scarce. For the most part, the student has merely made the microscopic rounds of the typical abnormal growths; his fundamental ignorance of biology, which no serious attempt is made to cure, comes

¹ A Chicago drill-master is reported as having classes of 300.

² Letter from Richard M. Pearce, professor of pathology, University and Bellevue Hospital Medical College (New York University).

³ e.g., University of Oregon, Portland.

between him and a really intelligent grasp of the principles and bearing of pathology. One is not surprised to find the instruction once more heavily inclined to the didactic side: 72 out of 144 hours at the College of Physicians and Surgeons, Chicago; 90 out of 140 at the College of Physicians and Surgeons, Baltimore.¹

Bacteriology—the last of the sciences concerning which there is even a pretense—fares in general rather worse. At the Medico-Chirurgical of Philadelphia the subject is the best developed of all the scientific branches; elsewhere it is a mere tag to pathology. Sterilizers, incubators, and culture-tubes are of course common enough; this is the orthodox equipment, stipulated by the state boards. But the subject cannot be intelligently studied without animals,—cats, rabbits, or guinea pigs. In general, one finds no arrangements to care for animals either before or during experimentation.² As a rule, “they are too difficult to keep;” at Creighton, Oakland (California), the Cleveland College of Physicians and Surgeons, the University of Vermont, Georgetown University (Washington), they are “got as needed,”—elsewhere, often not even then. “I think I am not violating any confidence,” says Dr. Victor C. Vaughan,³ “when I say that there are certain men who teach bacteriology who start at the beginning of their lectures with a lot of tubes already made. They do not know enough about bacteriology to make cultures. They hold up these tubes and say, ‘This is a diphtheria culture; this is a culture of tubercle bacillus,’ and if by any chance a culture goes bad, they send and get another.”

(8) There yet remains for our consideration the third variety of school on the high school or equivalent basis, namely, those described as basely mercenary. In point of equipment and teaching methods these schools are not substantially different from institutions on a still lower basis.⁴ Some of the latter institutions show, indeed, a better spirit: the University of Alabama, at Mobile, the College of Physicians and Surgeons and the School of Medicine, at Atlanta, the Medical College of the State of South Carolina, at Charleston, are not without traditions and a certain present dignity. Educationally, however, subject to certain exceptions to be specified from time to time, they may without violence be considered together; for limitations of one kind or another—now of equipment, now of intention, again of both—make the effective teaching of any of the laboratory sciences frankly impossible. They are for the most part cramming establishments, in many of which it is freely admitted that the students do not even own the regular textbooks. Their main weapon is the quiz-compend. Such laboratories as they have cannot be effectively used; of teaching accessories—books, museum, modern charts, or models—they are generally devoid.

¹ At the Johns Hopkins, out of a total of 400 hours, 40 are didactic; at Minnesota, out of 456, 146; at Wake Forest, out of 198, 50.

² The College of Physicians and Surgeons, Baltimore, operates a Pasteur plant, but animals are only slightly used in teaching.

³ *Third Annual Conference, Council on American Medical Education, American Medical Association, held in Chicago, April 29, 1907*, p. 59.

⁴ Those in the south and elsewhere asking two years of a high school, or less.

It is indeed stretching terms to speak of laboratory teaching in connection with them at all.¹ It is hardly more than make-believe; in the better schools, a futile imitation, without actual bearing on the subsequent clinical work; in others, a grudging compliance with the state board behest; occasionally there is nothing at all. The Mississippi Medical College (Meridian) did not, when visited,² own a dollar's worth of apparatus of any description whatsoever; the pathological laboratories of the Chattanooga Medical College and the College of Physicians and Surgeons, San Francisco, rejoice in the possession of one microscope apiece; Halifax Medical College provides one utterly wretched laboratory for bacteriology and pathology; the Toledo school has a meager equipment in one or two branches, but for the rest is bare; the Detroit Homeopathic College has a dirty and disorderly room, with a few dozen wet specimens, that is called the pathological laboratory; at the Milwaukee Medical College, bacteriology is represented mainly by several wire baskets of dirty test tubes; Temple University (Philadelphia) has no individual outfit for students in any science at all; the Chicago National Medical University is practically as bare as the Meridian school; the eclectic school at Lincoln, Nebraska, pretends to give clinical instruction in Lincoln, laboratory instruction at Cotner University, a few miles from town. When questions are asked in Lincoln regarding physiology or pathology, the answer is made: "That is given at Cotner;" when the same question is asked at Cotner, it is answered: "That is given at Lincoln." A quick transit from one to the other failed to find anything at either. Prestidigitation is, however, familiar enough in schools of this grade. Entrance credentials in the college safe frequently vanish as it is being opened: why should not equipment similarly resent inspection? At the College of Physicians and Surgeons, Denver, the outfit in pathology and bacteriology was mostly stored in a certain compartment under a table. There was some difficulty and delay in opening it; by the time the key was found, everything had disappeared except an empty demijohn and some jugs, obviously too clumsy to whisk themselves away in such airy fashion. At Willamette University (Salem, Oregon) "physiology is taught experimentally." The apparatus? "That is kept in a physician's office downtown." At the Eclectic Medical College of New York an inquiry was made as to the teaching of experimental physiology, no outfit for which had been noticed in the course of the inspection. A mere oversight! A messenger was despatched to fetch it, and did—a single small black box, of about the size and appearance of a safety-razor case, containing a small sphygmograph. "Good standing" requires the schools of St. Louis and Chicago to own a certain equipment in experimental physiology. They do; it is displayed prominently on tables, brand-new, like samples shown for sale on a counter; the various parts had never been put together or connected at the College of Physicians and Surgeons or at the Hippo-

¹ e.g., Western University (London, Ont.), Halifax Medical College, University of Arkansas, Southwestern University (Dallas, Texas), Fort Worth University, Epworth University (Oklahoma City). Other examples are given in the text.

² January 12, 1909. It was then in its third year.

cratean, both of St. Louis, at the Western Eclectic (Kansas City), or at the College of Physicians and Surgeons (Denver). The Littlejohn School of Osteopathy (Chicago) was in the throes of rebuilding to accommodate the growing classes that seek its superior advantages: every "laboratory" but that of chemistry was dismantled; there was no prospect that they could be again set up for months, but the teaching of "science" went on just the same.¹

Chemistry is the "star" laboratory course of these schools—"medical chemistry," of course. It never rises above a fair high school level and often falls far below it. At Chattanooga the students could not follow the subject, however simply presented. The laboratories are of the most elementary description,—sometimes active and in good order, as at Mobile and Augusta, at the Illinois Medical College, and at the Eclectic Medical College of New York; oftener in utter disorder, as at the Maryland Medical College (Baltimore). At the University of Oregon (Portland) and Willamette (Salem, Oregon) there is no running water at the desks; at the North Carolina Medical College (Charlotte) a single set of reagents is provided for the entire class; at the University Medical College, Kansas City (Missouri), instead of individual reagent sets, huge bottles are provided for general use.

Almost, but not quite all the schools dissect. At Meridian (Mississippi), for example, anatomical material is too difficult to get. In Chicago they have learned how to teach anatomy practically without dissection. At the National Medical University the teacher dictates, the students learn; this process is kept on, night after night, from October until the middle of April. So far there had been no dissection at all, but there would be ultimately, in "May or June," though there were no cadavers at hand as yet. At the Jenner Medical College—also a Chicago night school—a similarly enlightened pedagogy was employed: "the subject is taught by lectures, with dissection from May 15 until the close of the session." The same methods are practised at Pulte—the Cincinnati homeopathic school—where dissection had not yet begun on December 14: "the anatomy teaching goes on independent of dissecting." At Kirksville, Missouri, in the American School of Osteopathy, anatomy is taught with a textbook the first year; lectures, demonstrating, and dissecting are postponed to the second year,—and the whole course takes but three years, all told. The Central College of Osteopathy, Kansas City, Missouri, holds that the student should know anatomy before he dissects: "he will get more out of it." On November 8 there was no cadaver in the school: they already had had one and "will get another in February." At the Bennett Medical College, Chicago, there was witnessed a quiz in anatomy in a room without a skeleton, bone, or chart. At the College of Physicians and Surgeons, Denver, it was impossible to find any evidence of active dissecting; and it was admitted that material was scarce: "there had been two bodies this year, ten men on each."

¹ These schools are generally quite devoid of teaching aids,—charts, modern models, etc. The rooms are bare. What they have is out of reach of the students: "if it were not locked up, it would disappear,"—a significant indication of the sort of students gathered in by low standards.

Elsewhere, dissecting-rooms are indeed found, but the conditions in them defy description. The smell is intolerable; the cadavers now putrid, as at Temple University (Philadelphia), the Philadelphia College of Osteopathy, the Halifax Medical School, and in many of the southern schools,¹ including Vanderbilt; again, dry as tanned leather, —at the University of Tennessee, Bennett (Chicago), Denver and Gross (Denver), Creighton (Omaha), College of Physicians and Surgeons, St. Louis, for example. At the Barnes Medical College (St. Louis) the first-year students listen to lectures only in the last "semester;" they are not permitted to dissect because first-year men only "hack and butcher." The dissecting-room of the Kansas Medical College, Topeka (the medical department of Washburn College), did duty incidentally as a chicken yard: corn was scattered over the floor—along with other things—and poultry fed placidly in the long intervals before instruction in anatomy began.

A few of these schools have the apparatus requisite to teach pathology and bacteriology in routine fashion: the Atlanta College of Physicians and Surgeons, for one. But in general they own an inadequate and at times decreasing supply of microscopes—for everywhere one hears theft assigned in extenuation of a short supply or defective instruments. Post-mortems are practically nil. None are claimed at Chattanooga, Atlanta, Charlotte (North Carolina), or Dallas (Baylor and Southwestern Universities); two in six years were remembered at the medical department of the University of Georgia (Augusta). In default of post-mortems, material is sometimes obtained from the surgeons; but not all the schools can even then prepare it properly. To cut matters short, hardened material and sometimes sections are bought "in the east." The student at most stains and mounts them. Too frequently he does no more than look at them through the microscope. Whether he sees anything, remains a problem; for he rarely makes a drawing. In many cases it is impossible to believe that even this is done. At the College of Physicians and Surgeons, St. Louis, individual lockers are provided; on examination they prove to be empty. An explanation is offered: "the boys bring slides and cover-glasses along; they furnish their own and keep them at home."

It is, of course, not to be supposed that these schools would be materially better even if well equipped and decently cared for. It makes very little difference to the student body that they assemble whether microscopes and incubators are provided or not. The poor fellow who in an unguarded moment is caught by advertisements, premiums, or canvassing agents² cannot be taught modern medicine, no matter what investments in apparatus the state boards force. Meanwhile the sole beneficiaries of the traffic are the teachers—as a rule, the small group that constitutes the "faculty;" in some instances, however, only the dean, who "owns" or "runs" the school. His associates profit indirectly by what is technically known as the "reflex." Their pro-

¹ An exception must be recorded in favor of the Memphis College of Physicians and Surgeons, where excellent rooms with hot and cold water are provided.

² Employed at Jefferson Park College, feeder to the Bennett Medical College, Chicago.

fessorial dignity impresses the crude boys who will be likely to require with their first cases the aid of a "consultant." The "dean" of one such institution was frankly explaining his methods. "What do you give your teachers?" he was asked. "Titles," he replied.

The less obviously commercial schools allege not infrequently that medical education no longer pays, that it is kept up for the sake of the "back districts." We have already shown that the back districts deserve and can get something better. Meanwhile the statement does not persuade. Hundreds of thousands of dollars annually pour into these institutions; in many cases, this has been going on for years. What becomes of the money? There is in general nothing to show for it; a few hundred dollars would replace the fixtures and equipment of most of them.¹

The discreditable showing made by our commercial medical schools must not, however, be permitted to obscure the fact that we have at this date perhaps thirty institutions well equipped to teach the medical sciences in laboratories usually of modern construction, invariably of modern equipment. Twenty years ago we had not one. Our immediate problem has therefore two aspects: on the one hand, to strengthen these institutions, increasing their number only as actual need requires; on the other, with all the force that law and public opinion can wield to crush out the mercenary concerns that trade on ignorance and disease.

¹ In a few places there is a considerable investment: Atlanta College of Physicians and Surgeons, Atlanta School of Medicine, the two Richmond schools, for example. See for detailed discussion, chapter viii.

COMPARATIVE SCHEDULE, FIRST AND SECOND YEARS

SHOWING BEARING OF ENTRANCE REQUIREMENT ON CURRICULUM*

FIRST YEAR

WESTERN RESERVE UNIVERSITY 32 weeks per year (College basis)			NEW YORK UNIVERSITY 32 weeks per year (Four-year high school basis)		MEDICO-CHIRURGICAL COLLEGE 32 weeks per year (High school equivalent basis)		UNIVERSITY OF ALABAMA 28 weeks per year (Nominal requirement)	
<i>Anatomy</i>	<i>Did.</i>	<i>Lab.</i>	<i>Anatomy</i>	<i>Hrs.</i>	<i>Anatomy</i>	<i>Hrs.</i>	<i>Anatomy</i>	<i>Hrs.</i>
Comparative anatomy	24	48	Lectures & recitations	96	Lectures	96	Lectures	56
Descriptive anatomy	84		Demonstrations	96	Demonstrations	96	Recitations	56
Splanchnology		32	Practical work	360	Recitations	32	Comparative osteology	120
Neurology		72	<i>Histology and Embryology</i>		Dissections	98-144	Practical anatomy ¹	144
Dissections		216	Laboratory work	128	<i>Histology and Embryology</i>		(all practical)	
Microscopical technique		16	Lectures and recitations	64	Didactic	64	<i>Inorganic Chemistry</i>	
Histology	24	32			Laboratory	96	Chemical physics	112
Microscopical anatomy	40	80	<i>Physiology</i>		<i>Physiology</i>		Chemical laboratory	168
Embryology	40	80	Lectures	48	Didactic	96	<i>Physiology</i>	
<i>Physiology and Bio-chemistry</i>			Recitations	32	Laboratory	128	(none in first year)	
Experimental physiology	16	64	<i>Chemistry and Physics</i>		<i>Chemistry</i>		<i>Physiological Chemistry</i>	22
Bio-chemistry	16	64	Lectures		Didactic	160	(part practical)	
Organic chemistry	64	112	Inorganic chemistry (36)		Laboratory	96	<i>Biology, Embryology, & Histology</i>	
			Organic chemistry (36)	96	<i>General Pathology</i>		Laboratory work	196
			Recitations	32	Didactic	64	<i>Pharmacy</i>	
			Laboratory work	112	<i>Hygiene</i>		Didactic	28
			<i>Bacteriology</i>		Lectures	32		
			Practical work	64	Recitations	?		
					<i>Materia Medica</i>			
					Lectures	64		
					Recitations	?		
					<i>Pharmacy</i>			
					Lectures	32		
					Laboratory	64		
					Recitations	?		
					<i>Bandaging and Surgical Dressings</i>			
					Practical	32		

Note page 96 says:
For freshmen
Total lectures 128 hrs.
Total recitations 64 hrs.
Total laboratory work 112 hrs.

¹ 2 to 5 p.m., 6 days per week, for 8 weeks.
 Hours figured out from announcement and the class schedule. See inspection report.

SECOND YEAR

WESTERN RESERVE UNIVERSITY			NEW YORK UNIVERSITY		MEDICO-CHIRURGICAL COLLEGE		UNIVERSITY OF ALABAMA	
<i>Anatomy</i>	<i>Did.</i>	<i>Lab.</i>	<i>Anatomy</i>	<i>Hrs.</i>	<i>Anatomy</i>	<i>Hrs.</i>	<i>Anatomy</i>	<i>Hrs.</i>
Descriptive anatomy	84		Lectures and recitations	96	Lectures	96	Lectures	56
Dissections		144	Demonstrations	64	Demonstrations	64	Recitations	56
Applied anatomy	64		Practical work	360	Recitations	32	Practical anatomy ¹	144
<i>Physiology and Bio-chemistry</i>			<i>Physiology</i>		Dissections	216	<i>Chemistry</i>	
Advanced experimental physiology	6	106	Lectures and recitations	96	<i>Physiology</i>		Lectures	56
Advanced bio-chemistry		32	Practical work	96	Lectures	64	<i>Physiology</i>	
Lectures and recitations	72		<i>Chemistry</i>		Recitations	48	Lectures and demonstrations	86
<i>Pathology and Preventive Medicine</i>			Lectures		Demonstrations	?	Laboratory work ²	64
Bacteriology	40	82	Organic chemistry		Laboratory	48	<i>Materia Medica</i>	
Protozoology	14	28	Physiological chemistry	48	Didactic	48	Lectures ³	28
General pathology and pathological histology			Toxicology		Laboratory	128	<i>Histology</i>	
Gross pathological anatomy	75	145	Recitations	16	<i>General Pathology</i>		Lectures	14
<i>Pharmacology, Materia Medica & Therapeutics</i>			Laboratory work	96	Laboratory	192	Laboratory	112
Pharmacology, toxicology, and prescription writing	19	38	<i>Materia Medica and Pharmacology</i>		<i>Bacteriology</i>		<i>Bacteriology</i>	
Experimental pharmacodynamics	24	60	Lectures	64	Laboratory	96	Lectures	11
Systematic pharmacology	12	6	Recitations	32	<i>Hygiene</i>		Laboratory	88
<i>Physical Diagnosis</i>			Laboratory work	63	Didactic	64		
Minor Surgery and Bandaging	30	24	<i>Pathology</i>		Laboratory	16		
<i>Surgical Recitations</i>	60		Lectures	16	<i>Pharmacology and Therapeutics</i>			
			Recitations	16	Didactic	96		
			Laboratory work	128	<i>Physical Diagnosis: Normal</i>			
			Lantern demonstration	16	Practical	64		
			<i>Elementary Clinic</i>		<i>Physical Diagnosis: Pathological</i>			
			Physical diagnosis	30	Lectures	32		
			Surgery	16	Demonstrations	?		
			Practical work	32	<i>General Etiology and Symptomatology</i>			
			Clinic		Lectures	32		
					<i>Surgical Pathology</i>			
					Didactic	16		
					Laboratory	32		
					<i>Surgical Fevers and Inflammations</i>			
					Lectures	16		

¹ 2 to 5 p.m., 6 days per week, for 8 weeks.
² 8 weeks of 8 hours per week (4 periods per week).
³ Only one hour (lecture) per week. See schedule.

Creditable representatives have been selected in each instance.

CHAPTER VI

THE COURSE OF STUDY THE HOSPITAL AND THE MEDICAL SCHOOL

THE THIRD AND FOURTH YEARS (A)

LET us make an inventory of the presumptive acquirements of the well trained medical student at the threshold of his third year. He knows the normal structure of the human body, the normal composition of the bodily fluids, the normal functioning of tissues and organs, the physiological action of ordinary drugs, the main departures from normal structure, and in a limited fashion the significance of such departures both to the organs and tissues immediately involved and to the general economy of the organism. He will have had his first lessons in physical diagnosis, learning, perhaps in the class-room through examination of his fellow students, the use of the stethoscope, the arts of palpation, auscultation, and percussion, accustoming his ear to the normal sounds, his fingers to the normal "feel," of the chest and abdomen in health. His studies in pathology will have introduced him further to the essential clinical terminology, obviating the necessity of a separate detached course in "elementary medicine."¹

It remains, then, in the first place to teach the student how to get from the direct study of the patient himself whatsoever data remain to be collected. He will then possess two sets of facts: one in a way indirectly obtained, through microscopic or other study of excretions, secretions, tissues, etc.; the other set procured directly at the bedside. He must learn the art of combining them; he must see them together as the total picture of the situation with which he is called on to deal. Upon this inductive process all intelligent therapeutic procedure is based: hence his final task—to learn through an extension of the elementary discipline that began in the pharmacological laboratory, the therapeutic measures calculated to meet the more or less precisely ascertained and inferred conditions, responsible for the disturbance he is trying to quell.

A somewhat absurd controversy has at times raged as to which is of the higher scientific quality or diagnostic value—the laboratory disclosures or the bedside observations. Occasionally champions of the laboratory prejudge the issue by calling pathology a real or pure or more or less accurate science, as against the presumably unreal or impure or inaccurate data secured from the patient himself. It becomes

¹ The place of pathology in the American medical curriculum—if the instruction takes advantage of it—saves us from the difficulty encountered in Germany, where pathology and clinical medicine begin together. "According to current use the study of general pathology and pathological anatomy begin simultaneously with attendance on the clinic. For that reason the first semester of the clinic is of very slight value. . . . We ought first to procure for the student clear pathological conceptions; only then will it be easy for him to follow the clinical instruction intelligently and profitably. I consider it absolutely necessary that the instruction in general pathology and pathological anatomy should precede the clinic." Von Strümpell, *loc. cit.*, pp. 16, 17.

a serious question of professional etiquette, who should speak first or loudest,—the pathologist, armed with his microscope, or the clinician, brandishing his stethoscope. To parallel the dispute, one must go back to the two knights who, meeting at a cross-road, disputed at the hazard of their lives as to the color of a shield which, as neither had stopped to reflect, had two sides. It is as profitable to discuss which was the right side of the shield as to raise the question of precedence between the laboratory and the bedside. Both supply indispensable data of coördinate importance. The central fact may be disclosed now by one, now by the other, but in either case it must be interpreted in the light of all other pertinent facts in hand. The scientific character of the procedure depends not on where or by what means facts are procured, but altogether on the degree of caution and thoroughness with which observations are made, inferences drawn, and results heeded. The essence of science is method,—the painstaking collection of all relevant data, the severe effort to read their significance in connection. These objects are promoted in some directions by the laboratory appliances that eke out our defective senses; even so, however, we do not escape or rise superior to these same senses; for with them we use the implements in question. Whatsoever, then, the senses actually ascertain, pertinent to the matter in hand, is scientific datum. The way to be unscientific is to be partial,—whether to the laboratory or to the hospital, it matters not. The test of a good education in medicine is the thorough interpenetration of both standpoints in their product, the young graduate.

If, then, a laboratory is a place constructed for the express purpose of facilitating the collection of data bearing on definite problems and the initiation of practical measures looking to their solution, the hospital and the dispensary are laboratories in the strictest sense of the term. And just as it makes no difference to science whether usable data be obtained from a slide beneath a microscope or from a sick man stretched out on a cot, so the precise nature of the act or experiment is equally immaterial: it matters not in the slightest, from the standpoint of scientific logic, whether the step take the form of administering a dose of calomel, operating for appendicitis, or stimulating a particular convolution of a frog's brain with an electric current. The logical position is in all three cases identical. In each a supposition,—whether expressed or implied, whether called theory or diagnosis,—based on supposedly adequate observation, submits itself to the test of an experiment. If proper weight has been given to correct and sufficient facts, the experiment wins; otherwise not, and a second effort, profiting by previous failure, is demanded. The practising physician and the "theoretical" scientist are thus engaged in doing the same sort of thing, even while one is seeking to correct Mr. Smith's digestive aberration and the other to localize the cerebral functions of the frog.

Certain conclusions as to clinical teaching follow. The student is to collect and evaluate facts. The facts are locked up in the patient. To the patient, therefore, he must go. Waiving the personal factor, always important, that method of clinical teaching

will be excellent which brings the student into close and active relation with the patient: close, by removing all hindrance to immediate investigation; active, in the sense, not merely of offering opportunities, but of imposing responsibilities.

Clinical teaching has had substantially the same history as anatomical teaching. It was first didactic: the student was told what he would find and what he should do when he found it.¹ It was next demonstrative: things were pointed out in the amphitheater or the wards, those who got the front seats² seeing them more or less well. Latterly it has become scientific: the student brings his own faculties into play at close range,—gathering his own data, making his own construction, proposing his own course, and taking the consequences when the instructor who has worked through exactly the same process calls him to account: the instructor, no longer a fountain pouring forth a full stream of knowledge, nor a showman exhibiting marvelous sights, but by turns an aid or an antagonist in a strenuous contest with disease.

The backbone of the structure is the clinic in internal medicine.³ This central fact cannot in America be too strongly emphasized. The sufficiency of the school's clinical resources depends at bottom on its medical clinic; the value of its training depends on the systematic thoroughness with which it is in position to use an adequate supply of medical cases. To sample a school on its clinical side, one makes in the first place straight for its medical clinic, seeking to learn the number of patients available for teaching, the variety of conditions which they illustrate, and the hospital regu-

¹The reader must not suppose, however, that this method of teaching or practising medicine is extinct. The following is quoted from the *Chicago Night University Bulletin*, vol. iii., no. 24, p. 169:

"A young married man, wife and babe recently returned from Arkansas. They were all loaded with so-called malaria. . . . The old mother came in to tell me of the cases and get some 'chill medicine.' She said they were all chilling three times a day. . . . I sent the little tot ipecac 1M. She said the mother chilled every morning about ten o'clock, and that during the chill she had a very severe cough which hurt her right side. . . . I sent the mother bryonia 200. She said the husband and father chilled at various times. Great thirst during fever, severe cough before and during the chill, with drenching sweat following the fever. I sent him rhus tox, 75M. The prescriptions proved to be rifle-shots for the mother and babe, for they never chilled again; but only a glancing shot for the husband. He missed his chill for a few days, when it returned with new symptoms and more severe and with which no medicine seemed to correspond. I saw him then personally. Found he still had cough during chill, but not before; that he wanted to be covered during fever just the same as during the chill, like nux v. and rhus t.; he had other symptoms which ruled these out. *After searching several hours with repertory in hand, I decided that this was a mixed case and agreed with no medicine in the book.* Hence, following Hahnemann's advice, I gave him cinchona (1M) to clear up his case. After twenty-four hours he chilled again. This time the most peculiar thing noticed was that he was very thirsty during the chill, but in no other stage. He drank large quantities, but during the heat and sweat, not a drop. Also that during the chill the coldness was relieved by the heat of a hot stove. He wanted to get near the hot stove. Remembering. . . that for a chill with thirst for large drinks of cold water, and no thirst in any other stage, ignatia stands alone, I gave him ignatia 1M. to be taken every two hours until he missed his chill—then to be discontinued. Well, he missed the next chill and also every one which has been due him from that day to this."

²This method, too, survives in both medical and surgical clinics. It is in process of abandonment in medical teaching, just as rapidly as proper arrangements for ward and bedside work can be made. But it is still favored by surgeons, despite its very slight practical value.

³"For clinical studies proper, internal medicine forms the center at German universities. Medical education there follows the principle that medicine is a scientific whole; . . . all its varied disciplines must play upon each other; and from this point of view internal medicine is regarded as the mother of all other clinical divisions." W. Lexis, *Das Unterrichtswesen im Deutschen Reich*, vol. i. pp. 138, 139 (Berlin, 1904).

lations in so far, at least, as they determine (1) continuity of service on the part of the teachers of medicine, (2) the closeness with which the student may follow the progress of individual patients, and (3) the access of the student to the clinical laboratory. It matters much less what else a school has by way of clinical opportunity if it has this, though, of course, the school that has it will have whatever else it needs too. The main point is that there is no substitute for a good clinic in internal medicine; the school sampled and found wanting there suffers from a fatal organic lesion. Excellent didactic instruction is no compensation; successful passing of written state board or other examinations is no proof that the school has managed to do without. A large surgical service with amphitheater operations every day in the week, a dispensary crowded with eye, ear, and throat cases,—these are all very well in their way. But one comes back to the medical clinic: that is the really important item. Until practical state board examinations can be trusted to disclose defective school facilities on the clinical side, it is thrice important to scrutinize carefully the situation of every medical school in this respect. For proper provision rests at this moment on the conscientiousness and intelligence of medical educators. Thus far the states have not adopted an examination procedure that will destroy schools not able to do their duty in regard to the medical clinic.

The student's clinical work is classified under four heads: (1) medicine, in which pediatrics and infectious diseases may be included, (2) surgery, (3) obstetrics, (4) the specialties, such as diseases of the eye, ear, skin, etc. A teaching hospital consists essentially of a series of wards, accommodating patients belonging to these several departments, each ward systematically organized with a permanent staff; of a clinical laboratory, similarly organized and in close organic relation with the wards; and of an autopsy-room. The clinical laboratory of the hospital is not the same as the pathological laboratory of the medical school. "A clinic of medicine needs a laboratory equipped with apparatus for chemical, physiological, pathological, and bacteriological work, not so completely equipped as is the laboratory of these respective departments in the medical school, but specially equipped for certain needs of the work."¹ On the value of the data thus obtainable it is unnecessary longer to dwell. The clinical laboratory is the connecting link between the two parts of the medical school; and it must be immediately accessible. The clinical teacher cannot stop for data that he must perhaps cross town to get; the student responsible for a particular case will not include in the facts on the basis of which he is making up his mind the results of an examination of blood, sputum, and feces, if these must be transported for study much beyond the hospital walls. Nor will the interne or the young practitioner require the knowledge in question before coming to a conclusion, unless he has formed at school the habit of so doing.² In this laboratory a theoretic-

¹ Henry A. Christian: "The Clinical Laboratory," in *Columbia University Quarterly*, vol. xi., no. 3, p. 339.

² "We see the necessity of laboratories with room for each clinical student, each with his work-place

cal course in clinical microscopy will precede the period when the student is specifically charged with responsibility for the laboratory facts in his own "cases," shortly to be described. Of equally essential importance to the rounding out of the medical curriculum is the autopsy-room, where the wise are brought to book. "Successful knowledge of the infinite variations of disease can only be obtained by a prolonged study of morbid anatomy. While of special value in training the physician in diagnosis, it also enables him to correct his mistakes, and if he reads its lessons aright, it may serve to keep him humble."¹

The teaching dispensary follows the same lines as the teaching hospital in respect to both organization and equipment, and must be constructed with its pedagogical use in view. It consists essentially of a commodious receiving-room, leading from which are separate rooms, sufficiently large, clean, well lighted, each assigned to a separate department. The several rooms are appropriately equipped with instruments, apparatus, etc., and with a recording system which enables the workers to keep track of each patient and to collate readily all cases of the same general character. Each department must have an organized teaching staff; the receiving-room must be in charge of a physician, who will assign patients to the departments to which they severally belong. The clinical laboratory must be at hand so that the necessary microscopical examinations can be made without loss of time.

From the teaching point of view, the hospital and the dispensary differ in certain respects; certain classes of cases do not usually enter the hospital wards at all: minor surgery, trivial medical ailments, numerous afflictions involving eye, ear, nose, throat, skin, etc. Ambulatory patients are also under less satisfactory control; a large proportion never come a second time. The dispensary is therefore excellently adapted to show a large variety of conditions; it is a relatively poor place to watch their development. In the dispensary the student can become expert in initial physical examination; but only the hospital wards enable him to study progress, to observe nature's comment on therapeutic moves. The dispensary corresponds to the "office hour,"—so important an item in the physician's early progress; the hospital ward represents the sick-room. Clearly, a huge dispensary does not wholly offset a defective hospital.

Between dispensary and hospital, clinical instruction in the third and fourth years is variously apportioned.² But apportioned they must be; for the mingling of third properly equipped. In building this well arranged laboratory the university has by no means erected something superfluous. . . . It has simply met a positive need. In putting the laboratories in such intimate relations with the hospital, and especially with the dispensaries, it has provided means for an immense increase of its facilities. It is a place for practice, for doing as an undergraduate the things that must be done afterward in carrying on the profession of medicine." George Dock, "Address at Opening of Clinical Laboratory of the University of Pennsylvania Hospital," *University of Pennsylvania Medical Bulletin*, Aug., 1909 (slightly abridged).

¹ Osler, *loc. cit.*, p. 144.

² Taking a four-year curriculum of 4100 hours as a basis, the pattern curriculum worked out by the Council on Education of the American Medical Association allowed 1970 hours to anatomy, physiology, physiological chemistry, pathology, bacteriology, pharmacology, toxicology, and therapeutics,—or, in other words, the scientific subjects included in the first two years. Clinical instruction gets 2130 hours, distributed as follows:

and fourth year students in clinical work is severely reprehensible,—an infallible indication of deficient clinical material, imperfect teaching organization, or of both. As for the rest, there can be no fixed rule. Important, mainly, is it that the student be brought into immediate and increasingly responsible contact with the disordered machine.

Let us consider briefly the dispensary first. The classes are divided into small rotating sections, each with regular appointments in every one of the dispensary departments. The sections, in charge of separate instructors, should not contain more than ten students apiece—rather fewer would be even better. The student is trained at once to take the patient's history, to make the physical examination, to examine blood, sputum, etc., and on the basis of all the facts thus amassed to make a diagnosis and suggest a course of treatment. The instructor stands by, to correct and to stimulate by question, criticism, or suggestion. Everything is a matter of record, and the student's work is thus part of, in a sense the basis of, the complete dispensary records. In the surgical out-patient department, bandaging, stitching up a wound, administering anesthetics, quickly fall to his lot. Schools favorably located in large cities are able to develop considerable out-patient obstetrical work. Thus the student not only amplifies his experience, but learns to combat the conditions under which he will subsequently be called upon to work. He should, of course, in justice to his charge, be accompanied by an instructor, though in the weaker schools this is by no means always arranged. Even so, however, out-patient obstetrical work, though an experience, is not a discipline: it does not dispense with the necessity of careful training in method under ideal hospital conditions. The young physician will never learn technique and the importance of technique properly except in the maternity hospital; having learned them there, his problem in practice is to secure the essentials even amidst the most unpromising environment. In certain of the specialties—dermatology, ophthalmology—the bulk of the direct instruction received is in the dispensary service. To some extent, of course, the conditions observed in them come under repeated observation in the medical clinics of both third and fourth years; full mastery of a specialty belongs of course to the postgraduate years. But the student must be sufficiently at home to help himself in emergencies and to know when and whence to seek further assistance.

The fourth year is spent in the hospital under precisely the same conditions. The class is again broken up into small groups. Each student gets by assignment a succession of cases, for a full report upon each of which he is responsible; he must take the history, conduct the physical examination, do the microscopical and other clinical laboratory work, propound a diagnosis, suggest the treatment. For this

Medicine (including clinical pathology and pediatrics),	800	hours
Surgery	600	"
Obstetrics and gynecology	240	"
Diseases of the eye, ear, nose, and throat	140	"
Dermatology and syphilis	90	"
Hygiene and medical jurisprudence	180	"

purpose he has easy access to the hospital wards. His "beds" are under his continuous observation from the day his "patient" is admitted until the day of discharge; or, in the event of death, he and the physician ultimately responsible for the steps taken in treatment repair with others to the autopsy-room to bring their knowledge to the test, as Thomas Bond quaintly phrased it. Meanwhile, the clinical teaching has closely followed the development of the case. At brief and regular intervals its status is reviewed. All other members of his group, and the patient too, are at hand when the student presents his report, which forms, once more, part of the permanent record of the case. At every point he has been checked up; the instructor in charge of the clinical laboratory inspects and verifies his work there; the clinical instructor, here. The latter officer reviews everything, pointing out omissions, errors, misinterpretation. The student has always an appeal. He may on second trial convince himself of his blunder. He may, however, be only the more convinced he was right, whereupon another look may persuade the instructor that it is he who errs! Subject to this control, complete, of course, from the standpoint of treatment followed, the student is a physician practising the technique which, it is to be hoped, may become his fixed professional habit; learning through experience, as indeed he will continue to learn, long after he has left school,—a controlled, systematized, criticized experience, however, not the blundering, helpless "experience" upon which the didactically or demonstratively taught student of medicine has hitherto relied for a slow and costly initiation into the art of medicine.

In the surgical ward, a similar arrangement is feasible. The student assists in the operation of his own "case" and follows the after-treatment. Obstetrical training pursues analogous lines. After preliminary drill with the manikin, the student first assists, then has charge under an instructor, of the cases in question. He learns in the hospital wards the proper care and manipulations, his experience supplemented, as we have pointed out, by a regularly organized out-patient department, which brings him in the home, in contact with the trying conditions that he will encounter in practice. Pediatrics and infectious diseases are likewise scheduled and organized. A simple method of rotation carries the student in this intimate and responsible fashion through all departments in the course of two years.

Demonstrative teaching necessarily accompanies the method described: in each group of five, only one student personally explores each case.¹ At the next bed a new protagonist comes to the front; and so on, until each man has had his turn. Always, then, four of the five men are getting demonstrative teaching, though of a somewhat intimate kind. The demonstrative method must, for lack of time, also be more widely employed: large sections are sent on ward rounds, in the course of which the instructor demonstrates the salient features of a considerable number and variety of cases. The defects of the method are manifest: it is not sufficiently direct, accountable, and systematic to constitute the sole lasting discipline. At best, the student becomes in

¹ In some schools two students have charge of each case, the principle remaining the same.

this way familiar with conditions singly and in their combination and interconnection. He gets cross-sections of disease—a most important experience, but, once more, not the same thing as the continuous observation of the developing disease process and the influence thereon from day to day of whatever therapeutic procedure is adopted. In the same way, an instructor in physics might take his students through a large laboratory, showing them how electrical attraction or some other single factor produces a particular type of effect in each of a dozen different experiments,—a most valuable method to impress upon them the specific tendency or effect of the force under discussion; but no substitute for experiments performed by the student himself from beginning to end, in which electrical attraction and much besides come into play. Under any but the most vigorous teaching, the demonstrative method may fail to stimulate sufficiently: the student looks and listens,—a passive attitude that may relapse into something more deeply negative. Finally, the ease with which an expert passes from case to case, the necessity of confining attention to decisive features which he selects, may, if not elsewhere corrected, tend to encourage the superficial examination and the hasty conclusions with which current practice may be justly reproached. Outside the wards there is a narrowly limited use for demonstrative instruction in the class-room or small amphitheater, where groups of cases can conveniently be shown; but the value of demonstration increases apace, as it approaches the intimacy of the individual experiment. Remoteness is quickly fatal. "The larger the circle of listeners, the more difficult for the teacher to hold the interest of them all; as soon as those sitting some distance off no longer see and hear exactly what is to be seen and heard, their thoughts run wild, they lose the logical thread of the diagnostic process."¹ This is especially true of spectacular amphitheater surgery, which is of meager educational value, though as a rule prominently exploited.

Other methods have their uses also; even the didactic lecture may not perhaps be wholly dispensed with. Case work is discrete; students rarely possess sufficient generalizing power to redeem it from scrappiness. At the bedside not much time is available for comprehensive or philosophical elucidation. The lecture—hugging as closely as may be the solid ground of experienced fact—may therefore from time to time be employed to summarize, amplify, and systematize. In time, the student's sense of reality will be sufficiently pronounced to enable him to grasp a rare condition that he knows only through exposition. The wards may have failed to supply an example. But however used—whether to classify first-hand knowledge or to fill up a gap—the didactic lecture would appear to be pedagogically sound only at a relatively late stage of the student's discipline. It has no right to forestall experience, filling the student with ill comprehended notions of what he is going some time to perceive.

Some ingenious Harvard men, profiting by the experience of the Harvard law school, have evolved an effective discipline in the art of inference. Just as a preliminary course in physical diagnosis, teaching the student how to gather his facts, is

¹ Von Strümpell, *loc. cit.*, p. 23.

valuable, so, it is urged, a formal training in the inductive handling of ascertained data may be of use to students whose logical habit has been none too strictly formed. "Let us assume such and such data: what do they mean? What would you do?" This is the essence of the case method,—a method, by the way, excellently adapted to class use, calculated there to develop the friction, competition, and interest which are powerful pedagogical stimulants. It is, moreover, economical, for it brings considerable numbers in touch with fertile teachers, at a minimum expenditure of time and energy.

The class in medicine has another use: it may be made the means of training students to use the "literature;" once more, of course, only by way of amplifying an actual sense-experience. One's own experience always falls short; yet without a very vivid realization of just what one's own experience is and means, one is in no position to use a vicarious experience intelligently. The careful taking and keeping of records is in the first instance the means of clarifying the student's own experience; the instructor's comments raise the questions which he may profitably investigate in the literature. The case record in full and an abstract of important publications on the same subject may well fill a regularly appointed hour given to informal conference and discussion. The student will thus get into the way of reading substantial journals and "running down" literature in the course of his actual practice.

It is a nice question as to how the student's time in the third and fourth year is to be apportioned between patient work, ward work, demonstrative and class exercises, and didactic lectures. The number of hours is itself necessarily elastic: for if the hospital is a laboratory, it is open at all hours, and, subject to the limitations fixed in each case by the condition of the patient, the wards may be used by students, even though no teaching is going on. The principle upon which division may be made has been, however, very clearly stated by Cabot and Locke. "Learning medicine is not fundamentally different from learning anything else. If one had one hundred hours in which to learn to ride a horse or to speak in public, one might profitably spend perhaps an hour (in divided doses) in being told how to do it, four hours in watching a teacher do it, and the remaining ninety-five hours in practice, at first with close supervision, later under general oversight."¹

In what relation is the medical school to stand to its hospital if the methods above described are to be instituted? Exactly the relation which it occupies to its laboratories generally. One sort of laboratory may as well be borrowed as another. The university professor of physics can teach his subject in borrowed quarters quite as well as the university professor of clinical medicine. Courtesy and comity will go as far in one case as in the other: in both it keeps teaching to the demonstrative basis,—or worse, according to the limitations prescribed. The student can never be part of the organization in a hospital in which he is present on sufferance. A

¹ "The Organisation of a Department of Clinical Medicine," by Richard C. Cabot and Edwin A. Locke, p. 9. (Reprinted from *Boston Med. and Surg. Journal*, Oct. 19, 1905.)

teaching hospital will not be controlled by the faculty in term-time only; it will not be a hospital in which any physician may attend his own cases. Centralized administration of wards, dispensary, and laboratories, as organically one, requires that the school relationship be continuous and unhampered. The patient's welfare is ever the first consideration; we shall see that it is promoted, not prejudiced, by the right kind of teaching. The superintendent must be intelligent and sympathetic; the faculty must be the staff, solely and alone, year in, year out. There will be one head to each department—a chief, with such aides as the size of the service, the degree of differentiation feasible, the number of students, suggest. The professor of medicine in the school is physician-in-chief to the hospital; the professor of surgery is surgeon-in-chief; the professor of pathology is hospital pathologist. School and hospital are thus interlocked. Assistants, internes, students, collaborate in amassing data and compiling case records. The student is part of the hospital machine; he can do no harm while all the pressure of its efficient and intelligent routine is used to train him in thorough and orderly method. There comes a time, indeed, in a physician's development when any opportunity to look on is helpful; but only after he is trained: his training he cannot get by looking on. That he gets by *doing*: in the medical school if he can; otherwise, in his early practice, which in that case furnishes his clinical schooling without a teacher to keep the beginner straight and to safeguard the welfare of the patient.

The relationship here indicated has not thus far, as a rule, proved attainable in the United States except through the separate creation of a university hospital. In Germany, where hospitals and universities belong to the same government, our problem does not arise; nor in England and Scotland, where hospital and school have grown up together. In the United States—outside, once more, the few fortunate institutions like Johns Hopkins, the University of Virginia, and the University of Michigan—the schools developed as detached faculties, craving, after a while, some sort of demonstrative teaching privilege in hospitals conducted by the municipality or by philanthropic associations as temporary homes for sick people. Political reasons in the former instance, prudential in the latter, generally forbade an exclusive relationship. Lack of funds interfered with the establishment of laboratories; competition between rival schools required that privileges be both divided and restricted; finally, the inferiority of the students was an insuperable obstacle to any teaching method which sought to use them in the wards in any responsible way whatsoever. More intelligent conceptions are becoming current: the student body improves; competition yields here and there to consolidation. Even so, there remain generally insuperable difficulties: purely philanthropic enterprises must be economically conducted, and they cannot in most places play favorites in the local profession. Adequate equipment, effective organization, and continuous staff service are therefore as a rule improbable. The hospital and dispensary which the medical school must provide to obtain these conditions need be large enough to furnish only the funda-

mental training of the student body in method and to afford the various members of the faculty their own several workshops. Each department needs beds and accompanying facilities enough to care for typical clinical cases for instruction and for such other cases as the teacher himself wants to study under the most favorable conditions. Beyond this requirement, other local hospitals may well provide supplementary illustrative material, particularly for advanced students. Once more, a long list of such supplementary opportunities scattered through the town is no substitute for the fundamental teaching and working hospital, on the existence of which even a fairly satisfactory use of additional and imperfectly controlled clinical material depends. Indeed, without such a teaching hospital, the school cannot even organize a clinical faculty in any proper sense of the term.

The control of the hospital by the medical school puts another face on its relations to its clinical faculty. What would one think of an institution that, requiring a professor of physics, began by seeking some one who had his own laboratory or had got leave to work a while daily in a laboratory belonging to some one else? That is the position of the medical school that, in order to gain even limited use of a hospital ward, has to cajole a staff physician with a professorial title! When the hospital belongs to the medical school, appointments are made on the basis of fitness, eminence, skill. A man is promoted if he deserves it; if a better man is available elsewhere, he is imported. Opportunities are his in virtue of the university's choice: it is absurd to reverse the order. The men thus freely selected will be professors in the ordinary acceptation of the term: they hold chairs in an institution resting on a collegiate basis,—a graduate institution, in other words. They will be simultaneously teachers and investigators. Non-progressive clinical teaching involves a contradiction in terms. The very cases which are exhibited to beginners have their unique features. New problems thus spring up. Every accepted line of treatment leaves something to be desired. Who is to improve matters, if not your university professor, with the hospital in which he controls conditions, with a dozen laboratories at his service for such aid as he summons, with a staff who will be eyes and ears and hands for him in his absence? These conditions exist in Germany, and clinical science has there thriven; they are lacking here, and clinical medicine droops in consequence. Undoubtedly, outright research institutions for clinical medicine are also necessary: the routine of the clinical teacher cuts into his time, to some extent limits the tasks he may essay, for the knotty problems of clinical medicine are excessively complicated and difficult. But the field abounds in questions for which the university hospital with its laboratories is the right place. Nor will the young doctor, for all his admirable technique, prove a progressive practitioner, even to the extent of keeping up his reading, unless his teachers have been so before him. ✓

By the laboratories connected with the university hospital we do not mean merely the fundamental laboratories, described in a previous chapter, or the clinical laboratory, just mentioned: the former as such deal with the subject-matter of their

respective sciences, in their general relations; the latter is part of the routine machinery of the hospital. To suffice for clinical investigation the laboratory staff must be so extended as to place, at the immediate service of the clinician, the experimental pathologist, experimental physiologist, and clinical chemist in position to bring all the resources of their several departments to bear on the solution of concrete clinical problems. Of these branches, experimental pathology and physiology have already won recognition; the next step in progress seems to lie in the field of clinical chemistry, thus far quite undeveloped in America.

It follows that in other respects, too, the clinical professors will be on the common university basis: salaried, as other professors are. Of course, their salaries will be inadequate, *i.e.*, less than they can earn outside,—all academic salaries paid to the right men are. But there is no inherent reason why a professor of medicine should not make something of the financial sacrifice that the professor of physics makes: both give up something—less and less, let us hope, as time goes on—in order to teach and to investigate. The clinical teacher should indeed not arbitrarily restrict his experience: he may wisely develop—preferably in close connection with the hospital—a consulting practice, assured thus that his time will not be sacrificed to trivial ailments. On the same basis, other university facilities are at the service of those who require unusually skilful aid; for at all points only good can come of educational contact with unsolved problems,—practical or other. But a consulting practice—developed in a professional or commercial, rather than in a scientific spirit—may prove quite as fatal to scientific interest as general practice. University hospitals, academic salaries, etc., make the conditions in which clinical medicine may be productively cultivated. They do not create ideals; and without ideals, superabundant and highly paid consultations are perhaps as demoralizing as superabundant low-priced “calls.”¹

The financial resources at this moment available are far from adequate to provide hospitals exclusively and continuously the laboratory of the clinical departments of medical schools, and faculties composed in the first place of scientific teachers of clinical medicine. Twenty-five years ago as much would have been said in reply to a plea for thirty medical schools each equipped with a complete set of scientific laboratories. When the number of our medical schools is once reduced to our actual requirement, the sum involved in properly equipping them with hospitals will not appear impossibly formidable. Meanwhile, existing hospitals may well enlarge their teaching facilities, where such facilities are open to a high-grade student body. Nothing is clearer than that an intimate relation to medical education properly carried on is to the advantage of all concerned,—to the larger public, by producing better physicians, to the patient, by procuring for him more competent attention. On this point there is no room for doubt. “I speak after an experience of nearly forty years,”

¹See, for example, Graham Lusk: “Medical Education,” *Journal Amer. Med. Assn.*, April 17, 1909, pp. 1229, 1230, and S. J. Meltzer, “The Science of Clinical Medicine,” *ibid.*, August 14, 1909, pp. 606–12.

says Dr. Keen, "as a surgeon to a half-dozen hospitals, and can confidently say that I have never known a single patient injured or his chances of recovery lessened by such teaching. Moreover, . . . who will be least slovenly and careless in his duties, — he who prescribes in the solitude of the sick-chamber and operates with two or three assistants only, or he whose every movement is eagerly watched by hundreds of eyes, alert to detect every false step? . . . I always feel at the Jefferson Hospital as if I were on the run, with a pack of lively dogs at my heels."¹ Miss Banfield, after an ample experience, looking at the question solely from the standpoint of patient and nurse, takes the same position: "As a matter of fact, in a properly administered hospital, medical schools are a protection to the patient rather than otherwise, for it usually means that the hospital is a very live one. . . . In teaching hospitals, I think that on the whole patients are generally better nursed, for every one is kept up to the mark, including the professors."² The committee appointed in 1905 to inquire into the financial relations between the hospitals and the medical schools of London, touch in their conclusions the point here in question: "We find," they say, "that the presence of a body of eager young men watching the proceedings of their teacher has the tendency to keep the medical man on the alert and to counteract the effects of the daily routine of duties."³

There is little difference of opinion as to the necessary size of a teaching hospital. Less than two or three hundred beds, in practically continuous occupation, can hardly supply either the number or the variety of cases required. It is held that a hospital of 400 beds will support a medical school of at least 500 students. It is highly important that the instructor should have the material that he needs when he needs it. The material must, moreover, be properly distributed: an abundant clinic in diseases of the eye is no substitute for defects in the departments of internal medicine and obstetrics; seventy-five cases of operated appendicitis do nothing to compensate for the lack of typhoid, pneumonia, or scarlet fever.

The size of the school has, of course, some bearing on the necessary size of the hospital, though the hospital cannot be allowed to shrink in exactly the same ratio as the number of students. Because two hundred beds may be made to suffice for one hundred students, it does not follow that twenty beds suffice for ten students. Twenty-five students require in general the same minimum as one hundred students. On the other hand, it is fair to weigh advantages and disadvantages against each other. A small number of students in a small but still fairly representative and completely controlled university hospital, through whose corridors fresh scientific breezes from the university and medical school laboratories blow, will get a better discipline in the

¹ W. W. Keen: "The Duties and Responsibilities of the Trustees of Public Medical Institutions," *Transactions Congress Amer. Physicians and Surgeons*, 1903.

² Maud Banfield: "Some Unsettled Questions in Hospital Administration in the United States," *Publications of Amer. Acad. Pol. and Soc. Science*, no. 351, pp. 46, 47 (slightly abridged).

³ *Report of the Committee*. Published for King Edward's Hospital Fund for London, by George Barber, 23 Fumival Street, Holborn, E. C. p. v, 15 (B).

technique of modern medicine than a larger body, loosely supervised in an antiquated city hospital where "students" are eyed askance as interlopers. The defects of the former, due to somewhat circumscribed experience, a hospital year will quickly redeem, for he has, and knows how to use, the tools; the defects of the latter will as a rule never be repaired at all. Such a hospital year is in any event highly desirable. It is to be hoped that a more effective and economical organization of preliminary education and a more intelligent public opinion may presently make its exaction generally feasible.¹

On the basis of the undergraduate instruction described, opportunities for advanced or graduate instruction must supervene. Such opportunities serve two quite different functions. In the first place, the various specialties must be systematically and thoroughly developed as graduate pursuits, resting on a thorough training and experience in general medicine. The number of these specialties is increasing, as more varied and more effective appliances suggest increased differentiation,—a safe tendency, in the interest of efficiency, provided the discipline required does not infringe upon undergraduate territory. In the next place, to these postgraduate institutions the hard-run intelligent practitioner in smaller towns will at intervals return, in order to be invigorated at the head-waters: he will want to get in touch with recent improvement, to see in a brief period a large variety of interesting material, handled by experts in his own field. To both these purposes, the larger hospitals of our great cities may freely lend themselves. Their abundant wards can be used to excellent advantage, even though they may continue to be governed by their present boards. It is probable that the obstacles to such use will largely disappear as the competitive and commercial exploitation of medical education is itself abandoned. For beyond all doubt, not the least serious of the deplorable consequences that have followed in the wake of mercenary medical education is the limitation of hospital opportunities, due to the rivalry of "faculties" and to the incompetent student body to which, largely because of such antagonisms, the intimacy of the ward privilege would have had to be extended.

¹ Our required medical course, prior to practice, now covers four years. In Germany five years must be spent at the university, a sixth in a hospital; in England, "official statistics published recently under the authority of the General Medical Council show that the mean length of the curriculum in the case of 1111 students investigated was three weeks less than seven years; only 14 per cent succeeded in obtaining a qualification in the minimum period of five years, 35 per cent obtained it in the sixth year, 18 per cent in the seventh year, 13 per cent in the eighth year. When the remaining 20 per cent obtained it does not appear, probably never. Looking at the figures in another way, we find that at the end of six years less than half had obtained a qualification for registration, and at the end of seven years only two-thirds." *British Medical Journal*, Sept. 5, 1908, p. 634.

CHAPTER VII

THE COURSE OF STUDY THE HOSPITAL AND THE MEDICAL SCHOOL

THE THIRD AND FOURTH YEARS (CONTINUED)

In the end the final test of a medical school is its outcome in the matter of clinicians. The battle may indeed be lost before a shot is fired: a low average of student intelligence and inferior laboratory training will fatally prejudice even excellent clinical opportunities, for they rule out certain essential features of clinical training on a modern basis. A serviceable type of doctor was doubtless once produced under conditions that we now pronounce highly unsatisfactory; again, students defectively trained sometimes meet with success in examination or other tests designed to ascertain the quality of their instruction. It is not necessary to investigate closely the merits of the test in order to refute the argument that it endeavors to sustain. The institutions that seek to establish the non-importance of facilities that they do not possess emphasize strongly the importance of those they do. And with good reason. Before undertaking the responsibility of instruction in chemistry or physics or biology, a competent teacher stipulates that he be provided with this, that, or the other. He is not to be put off with the assurance that some men have successfully mastered the subject without laboratory or tools. Very properly he takes the ground that whatever may be true of individuals, in general boys will be much better trained in a laboratory with the essentials than in a bare room practically without them. It is equally true of clinicians. Doctors have after a fashion been made by experience,—i. e., their patients paid the price; further, some graduates of every feeble clinical school in the country have passed state board examinations or obtained hospital appointments, at times after competitive examinations in which they defeated students from schools more highly favored; it still remains true that to do full duty by the young student of clinical medicine, his teachers need access to acute cases of disease in respectable number and variety; that the school which lacks such medical facilities is in no position to teach modern medicine.

In the matter of laboratories we discovered no slight cause for satisfaction. Within two decades the laboratory movement has gained such momentum that its future, even its immediate future, is in no doubt. A race of laboratory men has been trained and quite widely distributed. They know their place and function; they have educated the college administrator to accept them at their own valuation. Where deficient resources still force a compromise, the apologetic attitude is a sufficient promise of more liberal provision by and by. On the clinical side the outlook is less reassuring. The profession itself has in large measure still to be educated; the clinical faculty often stands between the university administrator and a sound conception of clinical training. It happens, therefore, not infrequently that a university president will hear

with astonishment, if not with resentment, that facilities made up of insecure and disconnected privileges scattered here and there through the hospitals, public and private, of a community now large, now small, do not satisfy the fundamental requisites of clinical discipline surpervening upon modern laboratory work; or that a surgical clinic is no substitute for a clinic in internal medicine. The regeneration of clinical education is therefore apt to proceed somewhat slowly: the sources from which well trained clinical teachers can be drawn are few; the places in which they can be freely utilized are equally restricted. Students trained in the laboratories on modern lines enter clinical departments still more or less unconverted. The result is at best a half-result, yet upon it progressive amelioration in large measure depends.

Once more a few schools meet the specifications set forth in the preceding chapter. We there urged that the backbone of clinical instruction must be a pedagogically controlled hospital best developed on its medical side. The exact status of the hospital may indeed vary: a proper footing has been obtained now through coördinate and coöperative endowment,¹ again through state support in connection with the state university,² at times through a really effective affiliation.³ The crucial points are these: (1) the hospital must be of sufficient size; (2) it must be equipped with teaching and working quarters closely interwoven in organization and conduct with the fundamental laboratories of the medical school; (3) the school faculty must be the sole and entire hospital staff, appointment to which follows automatically after appointment to the corresponding school position; (4) the teaching arrangements to be adopted must be left to the discretion and judgment of the teachers, subject only to such oversight as will protect the welfare of the individual patient.

As long ago as 1869 the department of medicine of the University of Michigan began in a remodeled dwelling-house, capable of accommodating twenty patients, the development of a university hospital on fundamentally sound lines. From this modest beginning a teaching hospital of two hundred beds has now grown up, every patient available for the purposes of instruction, in so far as his own welfare permits. The staff of the hospital is the faculty of the school; the ward service in his own department is the laboratory of the professor. Ward rounds and amphitheater clinics are used for demonstrative teaching; but, better still, students are assigned to individual cases, which they work up at the bedside and in the clinical laboratory. An isolation ward is provided for infectious diseases; a lying-in ward is administered by faculty obstetricians and senior students; recently a psychopathic hospital, thoroughly modern in construction and management, has been made available. Difficulties, of course, of a serious nature have been encountered; the state by a liberal policy has minimized them. Ann Arbor is a small residential town; it is necessary to attract or

¹ Johns Hopkins.

² Michigan; Iowa.

³ Lakeside Hospital and Western Reserve (Cleveland). The newly endowed Barnes Hospital (St. Louis) will occupy a similar position in reference to Washington University.

to transport thither many cases from other parts of the state. The outcome practically formulates for us the terms upon which such an enterprise is feasible: a modern equipment, a salaried clinical faculty, clean-cut ideals, and careful husbandry will build up a substantial clinic in a small American as in a small German town. It can be supplemented by bringing the hospitals of the entire state into working relation with the medical department of the state university. The expense of the establishment is relatively great; but the advantages over a divided, perhaps even a remote department,¹ are on the whole cheap at the price. How many more such institutions we should, however, now undertake to create is of course quite another question.²

The Johns Hopkins Medical School has been even more highly favored. Its hospital endowment was, fortunately, sufficient to warrant a comprehensive design from the start. The general teaching hospital then provided has been recently supplemented by generous benefactions that add separate clinics for tuberculosis, pediatrics, and psychiatry; wards, dispensary, clinical and scientific laboratories, cooperate for both pedagogic and philanthropic purposes. The clinical departments are organized like any other. Nowhere else in the country has so consistent a scheme been so admirably realized. The student is made a factor in the conduct of the hospital: he assists on the clinical side as clerk, on the surgical side as dresser, following the admirable method long in vogue in the Scotch and English schools. In each department he serves an appointed novitiate, following his "cases" from start to finish,—now to recovery, again to autopsy.

There is no insuperable reason why several other medical schools should not take advantage of a fortunate relation to hospitals to bring about an equally effective organization. In one place lack of money, in another, hampering tradition, alone prevents. The organization above described cannot be perfected unless these two defects are simultaneously cured. If hospitals are to enter into exclusive and practically complete relationship with a single medical school, the university must on its side procure funds which enable it to be independent of the local profession. Unless these two conditions are coincidentally fulfilled, the clinical situation cannot be thoroughly made over. Three Philadelphia schools (the University of Pennsylvania, the Jefferson Medical College, and the Medico-Chirurgical College), two Baltimore schools (the University of Maryland and the College of Physicians and Surgeons), and one Chicago school (Rush Medical College),³ are in sole and complete control of excellent hospitals, more or less adequate in size. The same intimacy is equally desirable and equally feasible for both parties in interest between Wesley Hospital and North-

¹ The divided department is discussed from the laboratory side, page 74; from the clinical side, page 119. For an account of remote departments, see (Part II) University of Texas, University of Indiana, Cornell University.

² Similar hospitals, not as yet so well developed, are at present connected with several other state universities: the Universities of Iowa, Colorado, Minnesota, Texas. The details are given in Part II, under the several institutions.

³ But in this instance the patient's consent must first be obtained.

western University,¹ between Roosevelt Hospital and Columbia University. The reluctance of the hospital to go the whole length is in these latter cases the most formidable obstacle to perfecting a relation that would be of incalculable advantage to all concerned. For assuredly the university medical schools just named, if offered complete teaching control, could cope with the problem of procuring means with which to reorganize their clinical faculties on a scientific and pedagogical basis. The enlightened action of its trustees is rapidly perfecting the same connection between the admirable Lakeside Hospital of Cleveland and Western Reserve University. The new Barnes and Children's Hospitals of St. Louis have engaged to do as much for the reconstructed medical department of Washington University. McGill, Toronto, the University of Manitoba (Winnipeg), and Tulane are in practically secure possession of clinical facilities that are adequate in respect alike to extent and control. It is to be noted that the schools above named do not own the hospitals in which their clinical teaching is given. Western Reserve and Lakeside thus prove the feasibility of a smooth working connection between a university department of medicine and a private hospital; Toronto proves the same as between a university medical school and a municipal hospital. Technically, neither set of trustees can renounce control; they must ratify appointments; but that act can either be reduced to a formality or expanded into meddlesome supervision, as the trustees choose. In the two instances cited, it has become a mere form; and two objects, both precious, are most effectively promoted in consequence. On the strength of these instances it is perhaps worth while to make one more plea for an understanding between existing hospitals and deserving medical schools. Cannot an arrangement be consummated by which the administration and financing of a private or a municipal hospital shall be left to the trustees and their appointed agents, while equally, even though not technically, complete and separate responsibility for the medical conduct of the hospital and for teaching within its wards is left to the medical faculty? As these functions are absolutely distinct from each other, there is no reason why two bodies of intelligent men, desirous of doing right in their respective spheres, should not thus coöperate. If, of course, the trustees are every now and then going to overrule the university in the securing of a teacher or to overrule a physician in his treatment of patients, the situation becomes intolerable and impossible. Instances have occurred, for example, in which the board of women managers of a children's hospital has forbidden the use of lumbar puncture. It is not strange that these things have happened, because neither party to the arrangement has had definite ideas as to the limits of its province. Now, however, that there is no further doubt as to just what the trustees ought to do, on the one hand, and as to just what the university ought to do, on the other, it would appear an auspicious time for extending the experiment. The list of teaching hospitals as above given is so far not large. It may, however, to some extent be lengthened by

¹ At present, clinics at Wesley Hospital are not limited to Northwestern University students.

adding schools with hospitals not as yet adequate in size, of which type the University of Virginia furnishes the most satisfactory example. Long contentedly a didactic school, this institution has just undertaken to develop a modern clinical department. The new and excellent University Hospital, with eighty ward beds, is still under size. But a speedy development may be somewhat confidently anticipated. Its problem is that which Michigan has already shown how to solve; meanwhile it is perfectly clear that the justification of such a school lies in the fact that its situation makes possible the most intimate relations between the clinic and the scientific laboratories, and a discipline in medical technique so thorough and so vigorous that a few gaps in the student's experience may prove relatively insignificant. There is every indication that the University of Virginia thoroughly appreciates both points.

By no means every hospital owned by a medical school is, however, to be reckoned a teaching asset. The details require to be closely scanned. In many cases they are private institutions, in process of being paid for out of their own profits and out of the fees of medical students, who are lured by the advertisement of a school hospital from which they get no good at all. Barnes Medical College (St. Louis) adjoins Centenary Hospital, "which affords clinical facilities surpassed by none and equalled by few;" but except for part of one floor, the building is given over to private rooms.¹

Where control ceases, ideals necessarily change. A medical school with its own hospital may of course be sterile. Unwise appointments may cut off all possibility of productivity; too much consultant prosperity may be fatal to scientific zeal; inbreeding may exhaust fecundity. On the other hand, an occasional clinician may keep his lamp trimmed despite every obstacle,—poor facilities, a precarious term of service, lack of appreciative sympathy. Neither the one nor the other contingency, however, militates against the position that as between the two systems a school hospital is in America essential to the existence of an efficient department of clinical medicine; that in its absence the general plane of instruction settles down to a distinctly lower level.

The best of the schools without a hospital which they can call their own do not lack for abundance or variety of clinical material. Rush, Northwestern, the College of Physicians and Surgeons (Chicago), Columbia, Cornell, and the University and Bellevue Hospital Medical College (New York), Harvard and Tufts (Boston), are not troubled for clinical material; some of them have more of it than they can possibly use,—much more than several of the university hospitals can ever hope to command. But the conditions to which they submit in order to gain access to it at all, though varying somewhat from place to place, are alike fatal to freedom and continuity of pedagogic policy. Our clinical failure concurs with the clinical success of the Germans in proving that freedom is the very life-breath of scientific progress,—freedom on

¹ Similar is the relation between the medical department of Lincoln Memorial University (Knoxville) and its hospital next door; between the University Medical College and the University Hospital (Kansas City); and between the Milwaukee Medical College and Trinity Hospital.

the part of the university to choose its own teachers, finding them where it may; freedom on the part of the teachers to strike out along whatever path they please. An artificial impediment will in general entail barrenness.

The institutions above named are necessarily confined to the local profession for clinical teachers,—a restriction that they would find intolerable in any other department and that they endure under protest in medicine, only because they are not yet financially in position to throw off the yoke. No disrespect to the practising profession in these large cities is implied: they are doubtless as good doctors as can be found anywhere. But they are not teachers; they have neither time for, nor effective interest in, productive teaching. If they were really as much interested in clinical science as in professional prosperity, they could as a body do much to improve hospital conditions on the pedagogical side. As a matter of fact, professional prominence and institutional rivalry keep the college tenure insecure, often chop the hospital services into short terms, compel hospital authorities to abridge teaching privileges in order to avoid friction, and present a solid and opposing front to the importation of outsiders, even though the outsider chance to reside in the same town. Under such conditions it becomes at once impossible to entertain in clinical medicine the ideals set up in the laboratories of pathology, physiology, or chemistry. One pitches one's expectations lower. It becomes a scramble for abundance and variety of "facilities" on the part of the schools; public hospitals split up and overload their services in order to distribute their favors widely; private institutions promote their prosperity by declining exclusive alliances. In Chicago staff positions in the great Cook County Hospital are awarded every six years by competitive examination; and the schools make what terms they can with the winners, who rotate from ward to ward at stated periods. No bedside clinics are allowed; patients are wheeled into teaching-rooms or amphitheatres for demonstration; anyone who purchases a ticket may attend any clinic that he pleases. The student gets an excellent chance to see detached conditions; what he loses is the opportunity to observe individual cases of disease in process of development and to correlate his own laboratory findings with symptoms observed at the bedside. As for the professors, whisked about in rotation, scientific study is out of the question. At Bellevue Hospital (New York), Columbia, Cornell, and New York University have each a "division," within which, however, they are not supreme; the medical board, composed of the entire visiting staff of all three schools and the fourth division,—the outsiders,—limits the freedom of the several parties in interest; final authority is lodged with a lay board, who have, for example, recently overruled Columbia in its own division. At Boston neither Harvard nor Tufts has the initiative in filling staff positions in the hospitals used in teaching. Appointments are made by seniority; it is well-nigh impossible for the school to break the line. In Boston as in New York, the large hospitals tend to have their own pathological departments, the permanence of whose relation to the corresponding department of the medical schools is decidedly uncertain. Money and educational opportunity are

thus both wasted. As a rule, services rotate every three or four months; the hospitals sometimes provide clinical laboratory space in which students work.¹ All these institutions possess supplementary facilities. In general, however, supplementary clinical opportunities are of fragmentary and precarious character; the medical school has as such no uniform constitution, nor is a single department an organized entity; clinical clerks may be employed by one teacher for three months, only to be spurned by his successor in the service at the close of his brief term. Fresh pathological material may be procured by giving a faculty appointment to a coroner's physician, while the professor of pathology scours the city in vain for admission to a dead-room; instead of compact departments pulling as a whole towards a definite goal, a half-dozen professors of medicine and surgery stand on an equal footing, each compelled to conform to conditions imposed by the hospital on the staff of which he is a transient sojourner, or holding the whip-handle over his own school, because the school cannot antagonize the clinical professor without imperiling its clinical opportunities correspondingly. The normal relation of school and teacher is inverted. The question is not, "Who is a good teacher?" but rather, "Who controls a hospital service?" In a large city, the curtain rises on a dozen hospitals, each already provided with a staff, and several medical schools, each requiring a faculty of men who can bring as their dower "clinical facilities." There is a lively competition: at once, every holder of a hospital service finds himself a potential professor of medicine, surgery, or whatnot. When the scramble is over, the counted spoils appear in the catalogue in the form of a list of the hospitals "open to students of this school." The hospital appointments are therefore valuable "plums." They give the holders the call in the matter of school rank; and school positions are still in most places of substantial commercial value. It happens, in consequence, that the schools under discussion are put together of two dissimilar pieces: the laboratory branches are of one texture, the clinical branches of another. The laboratory men are imported; their productivity has been increased by crossing the breed. The clinical men are local² and, with some notable exceptions, contentedly non-productive. There is little intercourse across the line in either direction. The redeeming feature of these schools is, then, simply the amount and variety of clinical material that their students see.

The plane drops once more as we leave behind these large schools and approach the next class. Conditions now become rapidly worse through aggravation. Hospital management becomes increasingly unsympathetic or unintelligent, thus keeping the schools on the anxious bench. In truth, not much can be expected. "Amongst the

¹ In a few services a continuous term prevails for the time being, — sometimes by arrangement among the teachers themselves, sometimes by way of personal compliment to an individual. Welcome as such improvements are, they are far from curing the trouble.

² One can in a few lines give a complete list of schools that can and do go outside the local profession to procure clinical teachers: Johns Hopkins, University of Michigan, University of Virginia, Yale, Tulane (in medicine), University of Pennsylvania, and Washington University. These institutions have imported perhaps a score or two of clinical teachers; there are almost 4000 more clinical professors in the United States and Canada who are practising local doctors.

hospital superintendents I know of, there are, besides a very few physicians, an ex-newspaper reporter, a ward boss, a china factory hand, various clerks, and a still more varied assortment of clergymen. . . . In order that domestic complaints may be removed, a committee of ladies is sometimes appointed, . . . their only claim to knowledge being that of the 'born housekeeper' supposed to be inherent in every woman. The organization and management of institution households, however, having little in common with that of a few maids and no sick people, the management of details by visiting committees is often but an added discomfort."¹

Such institutions are mere boarding-houses for the sick. Physicians call there as they call at a private house, seeing twenty patients in the former instance, a single patient in the latter. It is the difference between wholesale and retail,—no other; scientifically the "calls" are on the same level. The visiting staff of physicians is appointed through favor, pull, or bargain, and the schools make the best of it. A small clique occasionally controls the situation. Conspicuous fitness cannot be the sole or main consideration. A school rich in facilities to-day may be beggarly to-morrow. The medical department of Toledo University has just lost its main clinical support as one outcome of a local political overturning. The University of Minnesota has been fortunately hastened in the resolution to build its own hospital because a local upset reduced its former privileges. The Woman's Medical College of Philadelphia adjoins a hospital of which its faculty was once the staff; now there is no commerce between them. The Hering Medical College at Chicago (homeopathic) is in even closer proximity to a homeopathic hospital: a bridge connects them; but the barred doorway bears the legend, "No students admitted." Medical politics are decisive at Albany; to keep control in the hands of the dominant clique of the Albany Medical School (the medical department of Union University), the size of the faculty was recently increased, all the new members being adherents of the side in power. The City Hospital at St. Louis, the County Hospital at Denver, are frankly described as being "in politics."² Staff appointments made for personal or political reasons may of course be revoked for reasons that are no better. The uncertainty of any one connection constitutes a good reason for getting hold of as many as possible. Columbia, for example, used to be supreme at Roosevelt Hospital, opposite its laboratories; it is being gradually edged out,—a deplorable condition for all concerned; but it has recompensed itself abundantly elsewhere. The medical department of the George Washington University protects itself by providing that "every clinical teacher shall cease to be such teacher should his facilities for giving clinical instruction cease before the end of his term of service."³ If a school drops an indifferent teacher, it may be worse off than if it retained him; for he keeps, and the school loses, the "clinical facilities" that he represents. St. Louis University, in purchasing

¹ Banfield, *loc. cit.*, pp. 42, 43 (abridged). Occasionally, feeling is cordial, as at Topeka, for example.

² The same is admitted at Halifax, N. S.

³ *Ordinance to Reorganize the Department of Medicine*, section 3.

its present medical department, contracted to keep the clinical professors in their chairs for a term of years. When the term expires, they are free to drop them,—at the cost, however, of cutting down their clinics in the same ratio. In a few places things are held together somewhat more compactly by an arrangement that gives the school faculty the hospital services during term time. Such is the case at Mobile, Birmingham, and Chattanooga. But in general a hospital staff is composed of heterogeneous elements, appointed for reasons that cannot be classified. Representatives of no school and representatives of all schools, serving now through the year, again for a few weeks, now in one ward only, now rotated through several, make up a situation unfavorable to every interest involved. In New York the ancient ecclesiastical evil of plural benefices crops out unexpectedly: one individual may hold several appointments in hospitals so far removed from each other that he cannot possibly do even his perfunctory duty by them; instead of surrendering superfluous perquisites, he sub-lets them at will, according as fancy or personal interest may determine: the staff appointments appended to his name are so many scalps hung about his belt! There is no such thing as hospital policy: the wards have as little wholeness, as little intimacy of relation with each other, as the private homes in which these same physicians treat their personal patients; only a local accident puts one roof over them.

Teaching is obviously but an incident in the routine of these institutions. Not infrequently amphitheatres have been included in their construction; but they usually lack a clinical laboratory in which students may work, not a few lack it altogether. The failure to provide clinical laboratory space thus keeps instruction to the level of passive demonstration. The student has presumably spent two years in mastering certain medical sciences. A large part of this laboratory discipline was designed to enable him to gather a greater variety of facts than the bedside examination will disclose. Blood, sputum, urine, etc., all contain important evidence which the laboratory years equip the student to utilize. He has been taught to do certain things. But at the critical moment, when doing them will count, he may get no chance, in the first place, because at many hospitals, among them those mainly relied on by the University of Nebraska (Omaha), Denver and Gross (Denver), the Hahnemann Medical College (Philadelphia), and most southern schools, there is no clinical laboratory at all. At Denver "there is no equipment to make a culture, and the internes are rarely equal to it, anyway." At Omaha, the clinical microscopist of the university faculty was unable even to get material from the County Hospital; when he wanted gastric juice for demonstration, he had to manufacture it himself. In the second place, where a clinical laboratory is provided, "students" are as a rule not admitted. The work is done by a resident pathologist who has no connection with any of the several "schools" that are permitted to demonstrate cases in the amphitheater or in the wards; or by internes, equally detached and too frequently of very doubtful competency by reason of just the educational limitations we are deploring. To the clinical laboratories connected with the municipal hospitals of St. Louis, Chicago, Minne-

apolis, students have no access, though in these hospitals, rich in material, the students of St. Louis University, Rush and the College of Physicians and Surgeons (Chicago), the University of Minnesota, respectively, ought to be getting the best part of their clinical training. Not infrequently it is alleged that the students do "carry material for examination back to the college:" the students of the Creighton School (Omaha) and of the Los Angeles schools would thus have to transfer specimens of urine, feces, and gastric contents on the street cars across town,—distances of several miles. At Southwestern University (Dallas, Texas), a section of four students has an assigned patient at the City Hospital, perhaps a mile and a half distant, where there is no clinical laboratory; to work up material, they must carry it to the college building, —where there is no clinical laboratory, either. Educationally, an "academic" laboratory discipline that thus hangs loose, that cannot be brought to bear on specific clinical cases, must be largely wasted. There is no merit in making a blood-count unless the student has been disciplined to connect the blood-count with all other symptoms of the patient whose blood is counted. As it is, he beholds a patient, sees things pointed out, may even listen to his heart-beat; away off in the college laboratory, he has previously examined some one's urine, counted some one's blood, tested, perhaps, an artificially prepared gastric juice. But there is no connection; the discipline splits in the middle. Scientific habits of practice are not established in that way. Nor are loose habits, thus contracted, cured by an internship. Pupils are more apt to disappoint than to astonish their teachers; they do not generally better their instruction. In consequence hospital records made by internes graduated by these schools are scant and unsystematic. Defective methods at the University of Buffalo were extenuated on the plea that as internes they learn better; but the meager records of the Buffalo General Hospital disprove the claim. Whoever is responsible, poorly kept records are very apt to denote inferior bedside instruction. The situation is this: there lies the patient; teacher, interne, and students surround the bed. The case is up for discussion. A question arises that requires for its settlement now a detail of the patient's previous history, now a point covered by the original physical examination, now something brought out by microscopic examination at some time in the course of the disease. If complete, accurate, and systematic records hang at the bedside, there is an inducement to ask questions; doubtful matters can be cleared up as fast as they are suggested. That, then, is the place for the records,—full records, at that. In few instances are the records full; in still fewer are they, full or meager, in easy reach. At the University of Kansas, at Lane Hospital (Cooper Medical College, San Francisco), there is no uniform method of making or keeping records: "some men do better than others;" "it depends on the man." At the Protestant Hospital, Columbus, Starling-Ohio graduates are internes, the records are nurses' charts; at Trinity Hospital (Milwaukee), attached to the Milwaukee Medical College, the same is true.¹

¹ Similar instances can be cited from all other sections of the country: the records are nurses' charts at the hospital of the College of Physicians and Surgeons, Little Rock, and at the City Hospital—

The clinical facilities of the ordinary medical school are put together of scraps, the general character of which have now been described. They offer a medical clinic here, an obstetrical clinic there, a skin clinic somewhere else. Faculties numerically out of all proportion to the number of students are assembled in order to piece out the quilt: Fordham University has 72 instructors for 42 students; the New York Medical College for Women has 45 instructors for 24 students; the Toledo Medical College, 48 instructors for 32 students; the Oakland College of Medicine and Surgery, 42 instructors for 17 students. As the hospitals are scattered, time is wasted in going to and fro. All told, our 150 medical schools have resulted, among other things, in some 4000 professorial titles.¹

Imagine the engineers that would be produced if students were sent to a series of shops to see things done,—as far as they could be seen without interfering with the workmen! In no two of these hospitals is exactly the same kind of teaching privilege granted; and the privileges granted are highly precarious: the hours are arbitrarily limited, and number of beds is usually too small. Nowhere do they approach the ideal which the school might readily institute in its own hospital. They fall short, however, in varying degrees. In St. Louis the situation is lamentable. The City Hospital has a medical and surgical staff who “do no teaching,” and a teaching staff who “do no doctoring.” Each of the half-dozen schools in the town has one afternoon; the instructor must go out to the hospital the day before to select two cases for demonstration,—an amount of trouble which the better men are reluctant to take. The instruction consists in pointing out features and suggesting what ought to be done: in surgery, it may have been done already; in medicine, there is no telling. In either case, the entire process remains purely hypothetical. These opportunities are not infrequently treated as they deserve: at the St. Louis College of Physicians and Surgeons it was stated: “This is hospital day; lots of them don’t go.” In the County Hospital at Los Angeles, the main reliance of two university departments of clinical medicine,—one of them (the University of California) requiring for admission three years of college work,—students are not permitted to handle sur-

used by two schools—at Memphis; at Ensworth Hospital, one line in a ledger contains all the facts on record; at Topeka, the same is true; it is added that “laboratory reports are not kept, and physical examinations could not be found;” the histories, made up by internes at the Kansas City Hospital, are so irregular that “the visiting staff don’t even read them.” They are imperfect at the University of Texas (Galveston); defective and careless at the Maine General Hospital (Portland).

¹ See Table in Appendix, for a complete list. The disproportion in point of number between laboratory and clinical chairs is instructive. For example:

Institution	NUMBER OF FULL PROFESSORS IN				
	Anatomy	Pathology	Physiology	Medicine	Surgery (not including gynecology)
Cornell	2	2	1	5	9
Columbia	2	2	1	5	5
St. Louis	1	1	2	5	6
Denver and Gross	1	1	1	5	5
University of Louisville	1	1	1	4	8
Contrast with these					
Johns Hopkins	1	1	1	2	1

gical patients, and teachers "shall not conduct bedside clinics when possible to remove patients from the ward;"¹ on these terms 100 beds are available, for six hours weekly in surgery, and perhaps for a few more in medicine. At Creighton, students "witness the operation," and are admitted to about 90 beds. In Denver, students "are not much at the bedside; they just look on;" the hours are from 8.30 to 10 a.m., daily,—the early hour having been fixed, it is alleged, to prevent the attendance of the state university boys at Boulder. There are "ward classes" at Memphis—as many as fifty students in a group at once!

Where things are patched up in the way described, it is of course impossible that proportions and relations should be observed. We have urged that the backbone of clinical training must be internal medicine. But it is precisely here that the schools are in general weakest. The sum total of accessible beds may amount to a hundred: not infrequently less than one-fifth of them will contain medical cases. The "additional facilities" of the larger schools are mainly surgical in character; and in general, the less a school has to offer in the way of clinical facilities, the more heavily is surgery overweighted. Its pedagogical value is relatively slight; for operations are performed in large amphitheatres in which the surgeon and his assistants surround the patient, to whom they give their whole mind, in practical disregard of the students, who loll in their seats without an inkling of what is happening below. Most of the students see only the patient's feet and the surgeon's head. Only in rare cases, previously mentioned, in which the student helps to form the machine, do designated individuals take turns and become part of the operation,—making the examination, watching the procedure at close range, and "cleaning up" afterwards. Inadequacy in general is thus aggravated by increasing predominance of surgical over medical clinics. Clinical teaching thus tends more and more to concentrate in the amphitheater. The laboratory side sinks further and further into the background; the bedside work becomes more and more contracted. The whole thing is demonstrative—and at steadily increasing remoteness. At the University of Vermont juniors and seniors have most of their medical and surgical clinics together, averaging in medicine about three hours weekly one year and four hours weekly the next; and the work is mostly in the amphitheater. Dartmouth Medical School has access to 24 beds, eighty per cent of the patients occupying which are surgical cases. Bowdoin—to complete the list of the smaller New England schools—uses the Maine General Hospital, Portland, where surgery greatly predominates. Tufts has an imposing array of clinical facilities; but its medical clinic is limited to the Boston Dispensary and one service in the City Hospital. Kansas Medical College relies almost wholly on three hospitals, in which it gets a total of nine or ten hours' instruction weekly: in two of the three hospitals all the work is surgery; in the remaining, two-thirds of it. In the university hospital at Rosedale (University of Kansas), there were last year 240 patients, 190 of them surgical; six free beds are this year reserved for

¹ *Rules and Regulations, Los Angeles County Hospital, section 4, rule 12.*



medicine. Of course, the school has privileges elsewhere; but this small hospital is all that it controls, though two years of college work are required for admission. The Starling-Ohio Medical College (Columbus) uses several hospitals: in one 150 beds are open, "mostly surgical;" in another 40 beds, "mostly surgery." The Detroit College of Medicine has access to two hospitals; one of them, with 100 teaching beds, is fortunate in a fairly equal division between medicine and surgery; the other describes its work as nine-tenths surgical. The clinical instruction of Epworth University (Oklahoma City) is given in a hospital within which 30 to 40 beds are available, two-thirds to three-quarters of the cases being surgical. Drake University uses 30 beds during a weekly total of twelve or fifteen hours in two hospitals, in neither of which is the student essentially other than a passive witness. The Chicago College of Medicine and Surgery—being the medical department of Valparaiso University—has a hospital of 75 beds, about one-fourth usable for teaching; the Bennett Medical College (Chicago) has a hospital of 40 beds, 20 claimed as free; at Chattanooga, the city hospital contained, all told, in the course of the year 1908 something over 500 patients; at Augusta, about 300. Temple University (Philadelphia) has a hospital with 20 free beds; the Woman's Medical College (Philadelphia), 27; the New York Eclectic Medical College sends parties limited to three students to the Sydenham hospital twice weekly. The Physio-Medical College of Chicago got along last year with 167 patients; Western University (London, Ontario) has access to an average of less than 30 beds a year. At Trinity Hospital (Milwaukee), with 75 beds, mostly pay, — a part of Milwaukee Medical College, — nine-tenths of the cases or more are surgical.

We have, however, by no means even yet exhausted the subject of arbitrary clinical limitations. As a rule, only the general medical and surgical wards are open at all. Few of the hospitals possess an isolating ward, and not all of these permit students to see infectious diseases. The instruction in that important branch is therefore usually didactic. This holds true of some schools that ask two years of college work for entrance, Yale and the University of Kansas among them. It is true, too, of the New York Medical College for Women, the University Medical College (Kansas City), the Starling-Ohio (Columbus), the University of Tennessee, Baylor University and Southwestern University (Dallas), Louisville, Little Rock, Memphis, etc. At Albany it was stated that the hospital has a pavilion for infectious diseases, which the school might use: "it does n't, because the students are afraid." But the very worst showing is made in the matter of obstetrics. Didactic lectures are utterly worthless. The manikin is of value only to a limited degree. For the rest, the student requires discipline and experience. The safety and comfort of both patients—mother and child—depend on the trained care and dexterity of the physician. The practice is a fine art which cannot be picked up in the exigencies of out-patient work, poorly supervised at that. Principles, methods, technique, can be learned and skill acquired only in an adequately equipped maternity hospital; only after that is the student fit to be

trusted with the responsibilities of the out-patient department. Difficulties and limitations in such matters sit lightly on most of our medical schools. The hospitals of Atlanta and Los Angeles exclude students from the obstetrical ward; at Burlington there is no obstetrical ward, but the "students see more or less;" at Denver a "small amount" of material is claimed; at Birmingham it is "very scarce;" at Chattanooga there are "about ten cases a year," to which students are "summoned," how or by whom is far from clear. At the Hahnemann Medical College (Chicago) students "look on at internes who do the work;" a committee of the Missouri state board reports of the College of Physicians and Surgeons of St. Louis that it could find only incomplete records of 21 cases for a senior class of 57; at Augusta, Georgia, the cases "always come at night when you can't get students;" at Charlotte 15 cases were available from September 15 to February 4; the medical department of Lincoln Memorial University (Knoxville) has no out-patient department, but alleges "a few deliveries before the class;" Vanderbilt relies on out-patient work mostly. There is a senior class of almost 150 at the American School of Osteopathy (Kirksville, Missouri). In two months they had eight clinical cases in obstetrics. Perhaps most lamentable of all, the Woman's Medical College of Baltimore concedes its opportunities to be "inadequate." At Toledo, Louisville, the University of Tennessee, Kansas City, the University of Kansas, Albany, and Yale, obstetrics is practically altogether out-patient work; that is to say, the student gets about the same training as a mid-wife. At Willamette (Salem, Oregon) he probably does not get even that: for "obstetrics depends on private practice and is very precarious. The student sees a delivery when the doctor is willing to take him."

Not a few of the schools mentioned have elevated their entrance requirements until they already demand one or two years of college work for entrance, or expect to do so presently.¹ Meanwhile their clinical facilities remain what they were. Doubtless some of them will make haste to improve,—Yale, for example. Others will probably recede from their announced elevation,—as several have already done. Assuredly, students who improve their preparation will demand that the schools improve their facilities correspondingly. In the laboratory years this has generally taken place: he will be a dull fellow who does not quickly feel and resent the inferiority of the clinical end. In all fairness, the betterment of the facilities, the change of spirit and ideal, ought to have preceded as the warrant for the higher entrance standard. For the two-year college standard proclaims a university department. It still remains to be demonstrated that towns like Omaha, Washington, San Francisco, Topeka, Milwaukee, can recruit university faculties from the local profession. A university connection or a two-year college entrance requirement do not, of themselves, transform a medical school faculty. They merely impose upon it an additional strain.

The strain to which high entrance standards and good laboratory teaching at

¹ Kansas Medical College, Dartmouth, Yale, Creighton, Denver and Gross, Hahnemann (Chicago), Starling-Ohio, Milwaukee Medical, Wisconsin College of Physicians and Surgeons, etc.

once subject the clinical end is distinctly apparent in the remote half of the divided school. We have already¹ considered the perplexities of the laboratory end without contact with clinics. They appeared not insoluble. Whether two clinical years given by themselves with practising physicians as teachers can ever form a substantial texture is highly problematical. The latter half of a divided school is given by the University of California at San Francisco,² by the University of Nebraska at Omaha,³ by the University of Kansas in a suburb of Kansas City,⁴ by Bowdoin College at Portland.⁵ The American Medical Missionary College carries division still further. It is divided between Battle Creek and Chicago; but no single year is entirely given in either place. Every class is shifted in the course of the year from one town to the other. Nor does the division end here; for at Chicago, the clinical instruction is divided so that different pieces are given at widely separated places. These pieces do not touch each other, and none of them ever touches the laboratory work given in Battle Creek. Indeed, none of the detached clinical departments is doing well. The vitality of the clinic depends on the closeness of its commerce with the laboratory branches; otherwise the clinical end is not rooted. Thus far none of these has achieved either executive or scientific intimacy. A certain degree of executive unity may perhaps be secured through a dean freely circulating between the two parts, though if he is attached as professor to one end of the department, the other is apt to resent intrusion. Scientific unity seems in any case unattainable. The clinical men at Omaha or San Francisco simply cannot be at home in the laboratories of Lincoln or Berkeley. Laboratories must be duplicated at the clinical site if the clinicians are to be in touch with them: in which case the divided type of school tends to turn into the whole remote type illustrated by the medical departments of the universities of Texas at Galveston, Indiana at Indianapolis, and of Cornell at New York. The truth is that an efficient medical school is a compact whole, in which geographic unity of laboratories and hospital is essential to scientific and educational integrity. The wilted condition of the clinical ends of the divided schools is a warning that Michigan, now contemplating the removal to Detroit of the final year in medicine, may well weigh. Even separation of the two parts within one city is a disadvantage.⁶ Division seems justifiable only as a temporary expedient to get clinical material, pending a choice between concentration of the entire school at one point or the other, or outright abandonment of clinical instruction in favor of a two-year school.⁷

¹ Page 74.

² First half given at Berkeley. The latter half will be duplicated at Los Angeles. Leland Stanford Junior will shortly give the latter half of its medical course at San Francisco, too; its first half is given at Palo Alto.

³ First half given at Lincoln.

⁴ First half given at Lawrence.

⁵ First half given at Brunswick.

⁶ As at Rush (University of Chicago).

⁷ Several of the southern state universities and the University of Colorado are in this position.

Meanwhile we are not without schools that have practically no hospital connection at all. The Mississippi Medical College (Meridian) has absolutely no hospital facilities or privileges of any sort whatsoever. The Georgia College of Eclectic Medicine and Surgery (Atlanta), the California Eclectic Medical College (Los Angeles), are in the same plight. Others are hardly better: for example, the three Chicago night schools, one of which, the National Medical University, had two lonely patients on the top floor of the school-building, though claiming the usual relations with a private pay institution. Thrice happy for the nonce is the Hippocratean College of Medicine (St. Louis), a night school; it crosses no clinical bridges till it reaches them: as it is only three years old, it need not bother about hospital connections until next year! The Lincoln (Nebraska) Medical College deplores the fact that "there are no poor in Lincoln; hence students have no regular hours at any hospital, but depend on cases as they turn up." The Hahnemann Medical College of Chicago has two surgeons on the Cook County Hospital staff and a hospital of 60 beds; but the lay superintendent "does n't believe in admitting students to the wards, so that there is no regular way for them to see common acute diseases." The College of Physicians and Surgeons, Denver, had access to a hospital of 28 beds, "certain ones free." The medical school at Little Rock that trades on the name of the University of Arkansas, with which it is not even affiliated, is connected by a bridge with a city hospital that has a capacity of from twenty-five to thirty-five patients, some of whom are occasionally transported across into the amphitheater for operation or exhibition. The clinics of the medical department of Willamette University (Salem, Oregon) are somewhat intangible: whether medical clinics are held, and where, "depends on the cases." Not infrequently, schools advertise varied hospital connections that prove on investigation to be baseless or surreptitious. The Philadelphia College of Osteopathy claims "the freedom of every important surgical clinic in the great medical colleges and hospitals" of that city. Its hospital list is almost a page long; at the top stand the University and Jefferson Hospitals, to which its students can gain access only by concealing their identity. Rights or privileges they have none. The College of Physicians and Surgeons of Boston announces that "equal opportunities and privileges are available in the hospitals and institutions" of that city, — a flagrant misstatement; for the students of that institution can on payment of fee attend only certain public clinics of little value.

It is unnecessary to describe dispensary conditions in equal detail: naturally they parallel the hospital situation. The same clinicians are responsible for both; in general, the dispensaries would be likely, therefore, to reflect the same degree of intelligence and conscientiousness. A teaching dispensary needs ample space, equipment for making the necessary diagnostic examinations and for taking simple therapeutic or surgical measures on the spot, a well organized staff, and a thorough record system, in the keeping of which students serve as clerks. Voluminous attendance is an advantage, because it permits selection in the first place, repeated illustration of important conditions in

the second. It may be set down as fundamental that a good dispensary will not run itself; that nothing in the way of equipment will be used that is not actually there. Economy of time is of such importance to both teachers and students that makeshift inevitably means neglect. The well conducted dispensaries are the well equipped and well organized dispensaries. The moment that equipment and organization fail, omission begins; no general rule prescribes where it will stop.

Vanderbilt Clinic—the dispensary attached to the College of Physicians and Surgeons, New York (Columbia University)—represents in respect to facilities the school dispensary at its best. Teaching and treatment rooms, ample in size and equipment from the standpoints of both students and patients, are provided; a clinical laboratory, with working space for every student on duty, is part of the building; close correlation of physical examination and laboratory tests is feasible. An admirably kept card index facilitates the keeping and use of data; there was an attendance in 1908 of almost 50,000 patients, making over 160,000 visits. The Johns Hopkins Dispensary and the Lakeside Dispensary, operated by Western Reserve, are equally efficient. Less sumptuously housed, but adequate in all essential respects, are the dispensaries of Cornell, New York University, the three Philadelphia schools, and those open in Boston to Harvard and Tufts. The Polhemus Clinic controlled by the Long Island College Hospital, the Homeopathic Medical Dispensary controlled by the Boston University School of Medicine, must be included in the number of excellently housed, equipped, and organized institutions of this kind.¹ Yale has an excellent building, which the application of a few thousand dollars yearly will readily convert into an effective teaching adjunct.²

The first break comes in the care with which an abundant attendance is handled. It would seem probable that, where the records are careless and incomplete, the treatment of patients is likely to be hurried. The compilation and arrangement of data slow the pace. They conduce to, and usually indicate, thoroughness and deliberation,—of fundamental importance if the student is to acquire a cautious habit. Lack of system and superficiality tend to run together. Mere mass of material, swiftly handled, may be useful to experienced practitioners in affording a variety of cases among which occasionally something rare and interesting may turn up; but a student who is in such a dispensary initiated into the routine of practice will be fortunate ever to form methodical and thorough working habits. The Los Angeles clinical branch of the University of California possesses a thoroughly admirable dispensary building. Some of the rooms are well, some ill equipped; the records are brief and non-significant; no report is compiled; and the clinical laboratory, indispensable to intelligent conduct of an out-patient department concerned to mould the student's

¹ A few institutions possess small, moderately well equipped dispensaries, the conduct of which indicates conscientious desire to do the best possible under the circumstances. Creditable examples are the dispensary of Drake University (Des Moines) and the South End Dispensary used by the Albany Medical School.

² Denver and Gross also has an excellent dispensary building.

habits and to do well by its patients, is both defective and disorderly: the surgical instrument case contained a tack-hammer, candle-ends, and other equally incongruous miscellaneous objects among its instruments. In the medical department of the University of Cincinnati, there is a card index alphabetically arranged; but the results of the physical examination are not given, nor is there any note of the treatment advised. The Starling-Ohio Medical College (Columbus) has a clean dispensary, with adequate attendance, but no records in a proper sense at all; Halifax Medical College requires attendance at a city dispensary that possesses little equipment for treatment, still less for teaching; besides, the college has no voice in its conduct. The students of Syracuse University also attend a city dispensary, but the head clinical professors know nothing about what they get, or fail to get, there. Utterly destructive of good habits of observation or treatment must be a dispensary like the North End Dispensary, Kansas City, attended by the students of the state university; equipment and records are alike defective and confused. But there are others much worse. Dispensary suites are found at the Barnes Medical College and the College of Physicians and Surgeons (St. Louis). The former claims an annual attendance of 10,000 cases. Several rooms are provided, those devoted to branches like gynecology and surgery being especially filthy. The equipment for internal medicine consists of a small dirty room and a few miscellaneous bottles of proprietary drugs scattered on the shelves of a bookcase. The dispensary of the College of Physicians and Surgeons is of the same general character: the gynecological room, for example, is without a window, water, or instruments; all is dark and dingy; there are no records of cases; evasive answers are made to all questions. The fact is that a dispensary, costing little to keep and nothing to run beyond the expense of a drug room, cannot answer for teaching. Nor can youthful volunteers be usually relied on to form an efficient staff. The expenditure on the score of dispensary must be greatly increased if the material that presents itself is to be effectively handled in the training of students.

These schools shade off imperceptibly into those that make no pretense to a dispensary at all, passing on the way institutions like Birmingham Medical College, with a department both small and poor; Augusta, without case records, not even prescriptions put up in the pharmacy being numbered; Portland (Oregon), claiming two to seven a day; the Jenner (Chicago), claiming two to ten nightly; the Physio-Medical (Chicago), with perhaps 250 all of last year; the Eclectic (New York), using "what comes to the college;" Charlotte, with loose unnumbered cards, mostly unintelligible, the prescription files showing an average of four or five a day. At the Detroit Homeopathic College one finds prescriptions written on scraps of paper, envelope backs, etc., with neither numbers nor names; at the Cleveland Homeopathic Medical College "medical cards are kept in pigeonholes that are cleaned out every spring." The Kansas City Eclectic school is hopeful, if not ambitious: its dispensary attendance averages now "about three daily;" they hope to be able "to work it up to six." The medical department of Bowdoin College uses a dispensary at Portland that

has an attendance of eight or ten a day: there are no case records, not even a prescription file, no clinical laboratory, and not so much as a microscope on the premises. The University of Alabama (Mobile) is the only small southern school with decent dispensary quarters: an attractive wing has been recently built for the purpose by the state.

There remains still the goodly number of schools that possess absolutely no dispensary provision at all. With some of them we are already familiar as destitute of hospital facilities. Without dispensary teaching of any kind, their students enter the homes of the poor,—to officiate at childbirth, to care for wage-workers on whose well-being depends the independence of the family. Meridian, the Georgia Eclectic, Willamette, the Lincoln Eclectic, the Hospital Medical College (Atlanta), the American Medical College¹ (St. Louis), the Chattanooga Medical College, Western University (London, Ontario), are representative schools of this description. It is painful to include in essentially the same class the Medical College of the State of South Carolina, at Charleston, which in lieu of a school dispensary refers to the out-patient work of the Roper Hospital, with which its students have nothing at all to do. The two Dallas schools—both long without a dispensary—are now starting one; Ensworth Medical College at St. Joseph, Missouri,—a city of 180,000,—has practically no dispensary at all; Epworth University (Oklahoma City) is in the same plight. Not a few of these institutions might develop a fair dispensary service if their opportunities were intelligently cultivated. For example, the University of Buffalo, in a city of 400,000, has a wretched dispensary with a daily attendance of from twelve to fifteen, if one can judge by sampling; for tabulated records there are none. Such notes as exist are brief and irregular. The poor do better to suffer in silence rather than to trust to the haphazard student medication that such institutions now supply.

Astonishing to relate, the conditions that have been portrayed are defended. It is alleged in extenuation that "our graduates pass state board examinations, get hospital appointments, succeed in practice." It is quite true: what of it? The argument if valid would commit every school above the lowest to deliberate deterioration of its facilities. Bowdoin makes light of a wretched dispensary on the grounds above cited; Dartmouth men succeed by the same tests without any dispensary at all; ergo, Bowdoin may safely forego dispensary teaching altogether. Is it not obvious that both are mistaken? that they take hold of the situation at the wrong end? Medical education is nowadays a definite problem, the factors to which, the end of which, may be specifically stated. We know exactly what it drives at; we can determine to a nicety the means necessary to reach the goal thus set up. It will shortly be demonstrated that the number of doctors needed can in most sections be supplied without material departure from the conditions agreed on. Why, then, should they be abandoned? In order that local doctors may continue to develop their professional

¹ At this school one is naively told that they have "a dispensary room, and almost every day some one comes."

business? In order that "historic" schools may continue to produce a slightly ameliorated type of didactically trained physician?

As a matter of fact, many of the schools mentioned in the course of this recital are probably without redeeming features of any kind. Their general squalor consorts well with their clinical poverty: the class-rooms are bare, save for chairs, a desk, and an occasional blackboard; the windows streaked with dust and soot. In wretched amphitheatres students wait in vain for "professors," tardy or absent, amusing the interval with ribald jest and song. The teaching is an uninformative rehearsal of textbook or quiz-compend: one encounters surgery taught without patient, instrument, model, or drawing; recitations in obstetrics without a manikin in sight,—often without one in the building. Third and fourth year men are frequently huddled together in the same classes. At the Memphis Hospital Medical College the students of all four years attend the same classes in many of the subjects taught.

So much for the worst. It may be, however, that in the case of some schools with weak hospitals and no dispensaries, the didactic instruction is vigorous, clean cut, in its way effective. Such is the claim made at Dartmouth and at Bowdoin. Let us concede its justice: what of it? Logically, the position of these institutions would be stronger if they stuck to didactic instruction altogether. The moment that they offer a course in clinical microscopy, they are committed to an entirely different scale of values. For that they require patients whom they can observe closely and continuously in order that laboratory data and bedside data may be put together as the basis of a specific judgment. In other words, teaching must henceforth be concrete, not abstract; clinical, not didactic. Good didactic instruction may indeed to some extent accompany clinical teaching. We are not especially concerned to determine its actual extent.¹ Let it earn the school an extra credit, if you please. But its excellence is no substitute for missing, defective, or badly balanced clinical opportunities.

¹ The subjoined comparative schedule indicates the distribution between clinical and didactic work in schools of various grades. This table is not alone conclusive; for schools with weak clinical resources are not infrequently without illustrative material, so that a clinical lecture may perforce turn into a didactic lecture. Moreover, clinical instruction of the amphitheater type may, if the students are few and the conditions good, be as useful as a bedside demonstration; where, however, the students are many and the conditions poor, it may be no better than a didactic exposition.

COMPARATIVE SCHEDULE, THIRD AND FOURTH YEARS

THIRD YEAR

WESTERN RESERVE UNIVERSITY				NEW YORK UNIVERSITY				MEDICO-CHIRURGICAL COLLEGE				UNIVERSITY OF ALABAMA			
Subject		Hours		Subject		Hours		Subject		Hours		Subject		Hours	
<i>Anatomy</i>	<i>Did.</i>	<i>Lab.</i>	<i>Clin.</i>	<i>Pathology</i>	<i>Did.</i>	<i>Lab.</i>	<i>Clin.</i>	<i>Anatomy</i>	<i>Did.</i>	<i>Lab.</i>	<i>Clin.</i>	<i>Anatomy</i>	<i>Did.</i>	<i>Lab.</i>	<i>Clin.</i>
Applied anatomy	96			Demonstrations		64		Applied anatomy	48			Anatomy of the eye, ear, nose, and throat	14		
<i>Pathology and Preventive Medicine</i>				Applied pathology	32	64		<i>Path. & Bacteriology</i>				<i>Pathology</i>			
Gross pathological anatomy		32		Bacteriology		64		Pathology	96			Lectures, recitations, and laboratory	28	112	
Autopsy technique		10		<i>Pharmacology</i>				Bacteriology	32			<i>Therapeutics</i>			
Hygiene and preventive medicine	40			Lectures	16			Surgical pathology	32			Lectures and recitations	56		
<i>Pharmacology, Materia Medica & Therapeutics</i>				<i>Therapeutics</i>				Autopsies				Electro-therapeutics ¹	56		
Pharmacology	84	20		Lectures and recitations	96			<i>Therapeutics</i>				Lectures and recitations			
Therapeutics	32			<i>Medicine</i>				Prescription dispensing	16			Medicine			
Advanced prescription writing		6		Section work: hospital, dispensary, and bedside	192			<i>Medicine</i>				Lectures and clinics ²	56		
<i>Medicine</i>				Clinics		96		Med. & clinical med.	64	64	64	Physical diagnosis	28		
Physical diagnosis			68	Diseases of children	64			Pathological physical diagnosis				Clinical diagnosis		56	
Medicine and clinical medicine	64		96	<i>Surgery</i>				Children's diseases	32						
Clinical microscopy	35	105		Lectures and recitations	192			Nervous and mental diseases	32			<i>Surgery</i>			
Medical dispensary			24	Section work: hospital, dispensary, and bedside		96		History taking				Lectures and clinics ³	38		
<i>Surgery</i>				Clinics		96		<i>Surgery</i>				<i>Obstetrics</i>			
History taking	12			Operative surgery	32			Lectures and recitations	192			Lectures and recitations ³	112		
Surgical diagnosis	20			<i>Obstetrics</i>				Clinics		128					
Fractures and dislocations	18			Manikin work	8	3 wks.		Operative surgery & bandaging		50					
Genito-urinary surgery	12			Lying-in hospital				Orthopaedic surgery			32				
Principles of surgery	64			<i>Gynecology</i>				<i>Obstetrics and Gynecology</i>							
Clinical surgery		60		Recitations and demonstrations	32			Obstetrics	96						
Surgical pathology			36					Gynecology	32		32				
Surgery dispensary	32		24					<i>Specialties</i>							
Eye, ear, nose, & throat	64		12					Ophthalmology			32				
<i>Obstetrics & Gynecology</i>								Laryngology			16				
Obstetrics	32							Otology			16				
Gynecology								Dermatology			32				
								Medical Jurisprudence & Toxicology ¹	32						

¹ Section work; exact number of hours not given.
² Part of this work is laboratory.

¹ On class schedule as "Electricity."
² Clinics are the same for 3d and 4th year classes.
³ Class schedule shows only one recitation per week.

FOURTH YEAR

WESTERN RESERVE UNIVERSITY				NEW YORK UNIVERSITY				MEDICO-CHIRURGICAL COLLEGE				UNIVERSITY OF ALABAMA			
Subject		Hours		Subject		Hours		Subject		Hours		Subject		Hours	
<i>Pathology & Preventive Med.</i>	<i>Did.</i>	<i>Clin.</i>		<i>Pathology</i>	<i>Did.</i>	<i>Clin.</i>		<i>Pathology</i>	<i>Did.</i>	<i>Clin.</i>		<i>Medicine</i>	<i>Did.</i>		
Hygiene	24			Conference	32			Autopsies				Medical clinics ¹			
Preventive medicine	20			Pathologic chemistry	6			<i>Therapeutics</i>				Nervous and mental diseases	42		
Medical jurisprudence	20			Autopsies		8		Applied therapeutics				Tropical medicine	56		
<i>Medicine</i>				<i>Therapeutics</i>				<i>Medicine</i>				State medicine	28		
Medicine and clinical med.	96	96		Conferences	32			Theory and practice	192			Dispensary, all subjects ²			
Physical diagnosis		50		Hygiene	32			Clinical medicine		96		Dermatology	28		
Ward clinics		40		Special subjects	30			Medical dispensary				<i>Surgery</i>			
Bedside work		32		<i>Medicine</i>				Diseases of children		32		Lectures and recitations			
Dispensary medicine		50		Recitations & clinics	60	96		Pediatrics dispensary				Lectures and recitations	70		
Clinical microscopy		1		Section work		72		Nervous and mental diseases	16	48		Clinics ¹			
Diseases of children	32	50		Neurology	32	12		Dermatology	16	32		Operative surgery			
Diseases of nervous system	32	23		Diseases of children	48	20		Dispensary dermatology				Genito-urinary surgery			
Dermatology and syphilis	64	27		Mental diseases	16			<i>Surgery</i>				Hospital section work ¹			
Medical ethics, economics, and Roentgenology		1		Dermatology	32	16		Lectures and recitations	192			<i>Obstetrics and Gynecology</i>			
<i>Surgery</i>				<i>Surgery</i>				Clinics				Obstetrics lectures	56		
Surgical diagnosis	12			Recitations & clinics	92	96		Genito-urinary surgery	16			Gynecology lectures	56		
Recitations	20			Section work		72		Orthopaedic surgery				<i>Other Subjects</i>			
Clinical surgery		192		Genito-urinary surgery	32	24		Ophthalmology				Hygiene and medical jurisprudence	28		
Dispensary surgery		50		Orthopaedic surgery	32	4		Laryngology				Ear & nose diseases	56		
Ward work, clinical microscopy, and assignment to cases		64		<i>Obstetrics and Gynecology</i>				Otology				Eye and throat diseases	84		
Ophthalmology		32		Obstetrics	34			<i>Obstetrics and Gynecology</i>				Ophthalmology			
Eye dispensary		50		Gynecology		52		Obstetrics	64						
Ear, nose, and throat		50		<i>Specialties</i>				Clinical obstetrics and manikin work							
<i>Obstetrics and Gynecology</i>				Ophthalmology	32	16		Gynecology	64	32					
Obstetrics	64	1		Otology	16	16		Gynecology ward clinics							
Manikin work				Laryngology	16	20									
Clinical gynecology		64													
Dispensary gynecology		50													

¹ Number of hours varies.

¹ When material is available.
² Section work; number of hours not given.

¹ Clinics open to 3d & 4th year classes.
² Clinics only for 4th year class.

CHAPTER VIII

THE FINANCIAL ASPECTS OF MEDICAL EDUCATION

AN examination of the financial aspects of the American medical school will completely account for the conditions that have been described.¹ It is universally conceded that medical education cannot be conducted on proper lines at a profit,—or even at cost; but it does not follow that it has therefore ceased to “pay.” It is commonly represented that medical schools are benevolent enterprises, to which selfish financial considerations are nowadays quite alien. Such is not even generally the case. Our best medical schools are indeed far from self-supporting; they absorb the income of large endowments or burden seriously the general resources of their respective universities. But these institutions constitute but a small fraction of the medical schools of the country. The others pay in one or more of several ways, if “paying” is understood to mean that the fees do more than meet the expense of running the school. This use of terms is entirely justifiable; for if fees alone are inadequate to meet the running expenses of an up-to-date medical school, then the difference between actual expenditure on instruction, with its essential incidentals, and the total fee income of the school is profit, whatever the use to which it is applied. In the worst cases this sum is great and goes into the pockets of the teachers; in many others, it may not be large in any single year, though its total over a stretch of years may be quite sufficient to have altered materially the complexion of the institution. In these schools an annual balance to the good is obtained for distribution by slighting general equipment, by overworking laboratory teachers, by wholly omitting certain branches, by leaving certain departments relatively undeveloped, or by resisting any decided elevation of standards. In one or more of these ways, for example, not to go outside the Empire State, the Albany Medical School is enabled to pay some \$500 a year apiece to otherwise well-to-do clinicians; the University of Buffalo to distribute “nominal sums” of \$1000 to a number of professors in large regular practice; the Long Island College Hospital to apportion a substantial sum out of the fee income in tithes among the faculty; and the University and Bellevue Hospital Medical College to pay out of fees salaries to some of the most successful practitioners in New York city, while the laboratory branches still lack anything like uniform development. More favorable, but still by no means beyond the reach of legitimate criticism, is the case of schools that, admitting the impossibility of providing satisfactory instruction at cost, nevertheless save from current use a not inconsiderable amount to be applied to paying for buildings or plant instead of dividends. Every such saving is necessarily at the expense of instruction; that is to say, if every dollar taken in were consumed in current teaching, unfortunate make-shifts would still have to be employed. With every dollar less than total fee income

¹See appendix for table showing income of medical schools.

used in providing teaching, the quality of instruction is still further impaired. As the country becomes able and willing to support at a loss the number of schools needed, the ethical justification of other schools that must pay a profit—even though that profit go into buildings and equipment—becomes decidedly dubious. ✓

Most of the existing medical school plants have been provided in this manner; quite commonly those who have participated in the operation fail to reflect on its significance. For if a good medical education costs more than the student pays in fees, then, even though an adequate plant has been provided in advance, his instruction must at some essential points be curtailed if additional income is not available. If, however, fees must provide either initial plant or plant extension, it is clear that proper teaching must be still further refused during the years when fees are employed to accumulate equipment. Historically that is the explanation of our extensive medical school plants in New York, Philadelphia, Baltimore, Louisville, Chicago: instruction far below what was at the moment scientifically feasible was given to the current student body, in order that their fees might be used to provide a better basis for a body of students that would come along in the future. Didactic lectures were given in 1890, to pay for a building in which laboratory instruction could be given in 1900. As conditions improved, one laboratory was put into operation, while a fee surplus was accumulated to install a second. Before the day of medical school support by endowment or taxation, such procedure compared very favorably indeed with the more common practice of doing nothing for the student of to-day and as little as possible for the student of to-morrow. The point now to aim at is the development of the requisite number of properly supported institutions and the speedy demise of all others. ✓

In varying degrees, contented acceptance of these conditions goes along with the survival, however insidiously, of the notion that medical education, whatever else it may be, is something of a business, too. It is questionable whether this notion can ever be uprooted, so long as several competing schools in the same or in adjacent towns solicit patronage that can never again be sufficient in volume to satisfy them all. The essence of a business transaction consists in spending less in producing an article than is paid for it over the counter, how much less depending now on the proximity and competitive eagerness of other dealers, now on the wariness and number of the customers. It matters not that in this instance the article is education, the counter the registrar's latticed window, the profit going in extreme cases in large sums into a doctor's pocket, in the best cases in smaller sums into bricks and microscopes. If, in other words, medical education is a social function, it is not a proper object for either institutional or individual exploitation. Society ought to provide means for its support according to the best light obtainable; and the law should make it impossible for any person or institution to engage in it on any other than the best terms that society is in position to enforce. Great departures from this principle were at one time inevitable: the country was bound to have doctors; it had to take them

as it could get them. They need never have been so badly trained as most of them were. But on that point it is useless to dwell. Important for us it is to ascertain whether in this year of grace, 1910, it is still necessary to put up with schools that are seriously defective; and if so, to what extent, and how much longer.

What does it really cost to carry on a medical school that construes its duty in social terms? Initial investment may be put to one side. That, the college income cannot furnish; fees cannot provide buildings and equipment in the first place, or pay for them subsequently in instalments. The medical school must start with an adequate plant, laboratory and clinical, debt free. The value of these plants may vary within very wide limits; size, style, the ratio of teaching to research, all bear on the problem of initial cost. In a measure it is a question of taste, how much one will expend on buildings and equipment. Essential, however, to every venture are class-rooms with the essential teaching paraphernalia, class laboratories in each of the sciences with individual equipment, private quarters with requisite appurtenances for each member of the teaching staff. These facilities cannot be dispensed with because the numbers to be handled are small. The several items may be scaled down, but they do not disappear. Fee income, confessedly inadequate to keep such a plant running, cannot be called on to provide it. The plant, therefore, is taken for granted before we even begin to consider what it costs to teach medicine.

For the sake of simplicity we shall continue the demarcation between laboratory and clinical branches. At present the cost of maintaining the hospital is not usually a school encumbrance. Whether or not it ought to be must be decided as the case arises. Western Reserve is in position to avoid the expense; the University of Michigan must carry it. In general, the school obligation on this point has been shirked. The intolerable compromises described in the preceding chapter are employed in consequence. Nothing will perhaps go further towards destroying superfluous schools or preventing new ones than correct ideas as to necessary hospital conditions. It is quite impossible that most schools should either possess their own hospitals or effect a satisfactory relation with hospitals belonging to other people. At the moment, possession rather than diplomacy seems in most places to furnish the only satisfactory solution,—and possession necessitates an immense increase of the school budget. Meanwhile, this point will not be obscured by provisional separation of the two budgets; for this manner of presentation an additional reason is found in the fact that, to a varying extent, the hospital may be made to carry itself without derogating from its pedagogical purpose.

A schematic outline of the laboratory years calls for at least five departments, (1) anatomy, (2) physiology and pharmacology, (3) chemistry, (4) pathology, (5) bacteriology and hygiene, subject, within limits, to rearrangement. The ultimate cost of the entire school will not be greatly affected by such redistribution. In their internal economy the departments will follow the same general lines. There will be a professor, devoting himself wholly to teaching and research, and in position to do both;

assistants varying in number with the size of the classes and the extent to which the institution is minded to encourage original activity; a departmental helper attached to each department; preferably, too, a technician and a mechanic, who will, however, in the end more than save their cost.

The budget of a department thus organized in a medical school of, say, 250 students, favorably situated, would assign \$3000 to \$5000 a year to its head, \$2000 to \$2500 to a first assistant, \$1000 to \$2000 to additional assistants, \$750 to a helper, and \$2500 to \$5000 to maintenance, including books, new apparatus, material, animals, etc. The total, ranging from \$9250 to \$15,250, still omits a proportionate share of the general overhead expense of administering the institution. A university department in one of the fundamental medical sciences, none too elaborately provided, cannot, then, on the average be effectively maintained for less than \$10,000 to \$15,000 per annum. At the moment, of course, the departments are not all equally expensive. Anatomy and pathology cost more than pharmacology and bacteriology. But the average is not thus seriously disturbed; for the former will extend above the line as much as the latter can be reduced below it. All of them, as they are developed, tend to cost more. Where the sum named has not yet been reached, the tendency towards it is unmistakable. It is, of course, true that fairly good instruction is at times furnished more cheaply. In the small two-year schools situated in small towns, the professors receive less, sometimes much less, than the sums stated; and the expense of maintenance does not at times exceed a few hundred dollars per annum. But these departments cannot continue on this makeshift basis: they are now manned by young men, who, finding themselves doomed to routine and sterility, begin fighting at once to get away. The teacher who is content under such circumstances will soon be out of date; and the instruction, however conscientious, will be decidedly limited in range. To live, these departments must be much more liberally supported; and in the small two-year schools where this has been the case—notably at Cornell and Wisconsin—the departmental budgets correspond pretty closely to our present estimate. The organization of a department of, say, physiology on the minimum basis of efficiency, for 25 students or less, would require, after providing the initial plant, \$3000 for the professor, \$1000 for his assistant, \$750 expense on the score of material for class use, \$250 to keep some little research going, \$300 for books and periodicals, \$600 for a janitor,—a total of \$5900 for the routine teaching of a few students under undesirable limitations. As it is clear that there is no justification just now for the existence of medical schools that are incapable of greatly bettering the type, it follows that schools unable or indisposed to spend the requisite sums lack a valid reason for being. We may then assume that the five departments of a properly organized medical school, capable of handling 125 students, in its first two years can hardly be properly sustained on a total budget of less than from \$50,000 to \$75,000 annually. If, now, the student pays \$150 a year for tuition, there will be an annual deficit ranging from \$31,250 to \$56,250 a year. Not all the medical schools that are

alive to their responsibility are, as we shall see, at this moment able to provide on this scale for each of the fundamental departments; but they are in no doubt that these departments need such support; and they are straining every effort to procure it for them.¹

On the clinical side, the problem is more complicated. We have seen that the relation of the medical school to its hospital must be of the same kind as its relation to its laboratories. But laboratories exist only for school purposes; the hospital dis-

¹ A comparison of the estimates above given with corresponding budgets in German universities is highly suggestive. Despite the fact that the cost of apparatus, supplies, etc., is much lower in Germany than here, the sums spent in various universities on laboratory maintenance are as follows:

KÖNIGSBERG (170 medical students)		BRESLAU (189 medical students)	
Anatomy	16,349 marks	Anatomy	26,618 marks
Pathology	9,860 "	Pathology	14,938 "
BERLIN (1107 medical students)		GÖTTINGEN (189 medical students)	
Anatomy	57,436 marks	Anatomy	19,850 marks
Physiology	89,766 "	Physiology	9,606 "

(From *Etat des Ministeriums der Unterrichts- und Medicinal Angelegenheiten*, 1909, Beilage 6.)

Still more significant is the ratio between expenditure for salaries and that for laboratory maintenance, and the steady encroachment of the latter: out of every 100 marks spent in German universities, there went in

1868	45.95 marks	to salaries	37.07 marks	to laboratories
1878	41.94 "	" "	40.46 "	" "
1888	36.00 "	" "	47.18 "	" "
1902	29.46 "	" "	53.77 "	" "
1906	27.93 "	" "	55.45 "	" "

(From *Preussische Statistik*, 304: *Statistik der preussischen Landes Universitäten*, 1908, p. 7.)

Finally, the actual sums spent on salaries and laboratories respectively tell the same significant story:

Total expenditure in Prussian universities in

1868	1,786,108 marks	for salaries	1,440,955 marks	for laboratories
1878	2,959,187 "	" "	2,959,103 "	" "
1888	3,305,125 "	" "	4,331,649 "	" "
1898	3,499,785 "	" "	6,094,316 "	" "
1906	4,308,980 "	" "	8,554,581 "	" "

(*Ibid.*, p. 14.)

That is, in 38 years, total salaries have increased 141 per cent, total laboratory expense, 490 per cent. In the same period, the total attendance of medical students in the same universities has risen 113 per cent (from 3771 in winter semester, 1868, to 3903, winter semester, 1906).

Paulsen (*German Universities*, translated by Thilly, p. 219, note) quotes from the Rector's Address of Adolph Wagner in 1896:

"Expenditures for salaries and institutes in the University of Berlin show the following growth:

Year	Salaries	Institutes
1811	116,550 marks (71.8 per cent)	39,294 marks (24.0 per cent)
1834	193,650 " (64.6 " ")	78,434 " (26.2 " ")
1880	321,000 " (52.8 " ")	267,000 " (40.1 " ")
1896-7	865,000 " (30.9 " ")	1,481,000 " (52.9 " ")

All the seminaries in the mental sciences (there are 18) cost 17,650 marks annually; the 15 natural-scientific institutes and collections cost 379,798 marks; the 10 medical-scientific institutes 190,054 marks; the 10 clinical institutes, 617,691 marks.

The publications of the Prussian government mentioned above are models, which we would do well to adopt. They enable us to follow in minute detail the educational developments of the last seventy-five years, with their social implications. The American student of similar problems deals with chaos. It is difficult to obtain definite and complete statements from any one institution; and quite impossible to compare data from several institutions without exhaustive inquiry by way of ascertaining whether they cover the same ground. The German statistics prove clearly, however, the point at issue, i. e., the rapidly increasing cost of properly organized medical education.

charging simultaneously a philanthropic office may, as we have seen, be provided for independently of school funds and yet be as intimately a part of the educational organization as if teaching were its main purpose. The school will invariably have to equip and maintain its laboratories; the hospital may be separately financed without burden to the medical school. Further, the initial cost of the hospital establishment may vary within large limits: a plain, but serviceable structure, capable of accommodating 200 patients, with proper teaching facilities, may be erected for a few hundred thousand dollars; or it may cost millions. The cost of maintenance also fluctuates considerably according to situation and scale of support. In the city of New York, it is roughly estimated that it takes \$1000 to maintain one bed for one year; a 200 bed hospital may thus readily involve an annual expenditure of \$150,000 and upwards. This sum may be reduced by profits derived from pay patients, or by small contributions from charity patients. The extent to which the provision of proper clinical opportunities falls upon the medical school varies, then, from place to place. It is therefore not included in the schematic school budget we are preparing; but it is important to emphasize clearly that where independent endowment or state support does not furnish the medical school with a hospital in which it is thoroughly at home, the burden falls at once upon the school. The substitutes, makeshifts, and compromises now so widely employed in the United States do not relieve the medical schools of their responsibility.

From the standpoint of the medical school, it is perhaps immaterial how its hospital is supported. But it would be unfair not to point out briefly in passing that certain larger considerations give great importance to the source of hospital support. The hospital in the United States is not necessarily privately managed because privately supported, or publicly managed because publicly supported: it may be privately managed, even though in large measure publicly supported. The teaching hospitals connected with the Philadelphia schools and with the proprietary schools of Baltimore are of this description. In respect to management they are private concerns; but they have received large lump subsidies from the state for both buildings and support. It is not the sole objection to this policy that it strengthens proprietary medical schools, though that is surely a legitimate criticism. More serious is the general demoralization that log-rolling always entails. Schools and hospitals, competing in all other matters, join hands in assaulting the state treasury; for coöperative action increases the total largess to be divided. The state or city can indeed legitimately aid medical education by completely handing over to high-grade medical schools the ward service in hospitals financially managed by the proper state or municipal authorities. The public interest would be promoted, not injured, if, for example, Cornell, Columbia, and New York University were each left in unfettered possession of its division at Bellevue (New York); there is no possible source of demoralization there. The Pennsylvania plan, however, tends to transfer the making of appropriations and the accounting for the same from the hands of state officials to

private parties whose common interest it is to increase appropriations and to reduce oversight.¹ The size of the appropriation is determined to greater or less degree by the violence of the onset. There is no fixed relation between the charity work done and the amount asked or secured.² In pursuance of that policy the state of Pennsylvania last year granted out of the public treasury to private and semi-private hospitals \$4,404,500.

However the hospital and dispensary are supported, the teaching budget of the clinical years is necessarily a charge upon the funds of the medical school. The professor of medicine in the medical school will be physician-in-chief to the hospital; surgeon, obstetrician, pediatrician, will likewise occupy the same dual relation. The university hospital will be their laboratory; their salaries will protect them against the distractions of successful practice, be that practice general or consultant,—for a thriving consultation business may prove just as fatal to scientific productivity as any other form of immersion in routine. The clinical departments must embody the same ideals as pathology or physiology in respect to teaching and research; they require, then, the same organization and support. The laboratory service must be extended for them. For the investigator in internal medicine needs not only a clinic, but a laboratory, in whose activities the bedside problem and the fundamental sciences are brought together. The professors of pathology, physiology, physiological chemistry, work on broad lines. The clinician applies what he obtains from them to problems that are narrower in compass. Neither the clinical laboratories, where routine examinations are carried on, nor the fundamental scientific laboratories, serve precisely the needs of the investigating clinician, though the latter are in the most intimate cooperation with him.

What may be called the theory of virtual endowment deserves a word at this point. Let us suppose that ten practitioners give their professorial services gratis. Undoubtedly their ethical position is better than that of practitioner teachers who draw dividends. They contend, however, that their services constitute an endowment. Paid teachers would get, say, \$3000 each. The \$30,000 saved represents five per cent on \$600,000. It is argued that the school is just where it would be if it had an endowment of something more than a half-million. Sanguine calculators of this type occasionally run the virtual endowments up to two or three millions. But virtual endowment is a poor substitute for good bonds. The volunteer teacher may begin well; but as between teaching and practice, the former must always get the worst of it. Slipshod dispensaries, imperfect hospital records, general clinical barrenness, tell the tale.

¹ Experts are of one mind as to the viciousness of this policy. See, for example, *Report on Subsidies*, National Conference of Charities and Corrections, held at Washington, D.C., May 9-15, 1901.

² The amounts secured vary from 12 cents to \$3 a day for free patients, according to the efficacy of the hospital "pull." In New York city "pull" is eliminated: the hospital is paid a fixed sum for service rendered. Nevertheless, even this method of procedure may have unfortunate educational consequences,—for it enabled the Brooklyn Post-Graduate Medical School to start.

The modern medical establishment that spends \$50,000 or \$75,000 upon its fundamental laboratories will, if it is to be equally productive in clinical medicine, spend an equal sum on teaching and investigation during the latter two years,—quite apart from the current maintenance of hospital and dispensary. That is to say, \$100,000 to \$150,000 will be required at the start to pay the minimum cost of a four-year school of medicine accommodating 250 students and consistently organized along sound lines on both laboratory and clinical sides. The outlay will increase, not decrease, as the school grows, not in number, but in scope and power. The proposed budget may look formidable just now, when compared with the scant provision that has been generally made for medical education in this country under men many of whom have had no real appreciation of what good medical training is, or costs; but as public sentiment and educational intelligence develop, the suggested scale will appear not only modest, but insufficient.

The fees received from such a student body would amount to some \$40,000; so that it may be fairly estimated that in such an institution fees will at the utmost pay little more than one-third of the expense, provided that proper hospital and dispensary facilities are already supported by endowment or otherwise. A comforting notion is prevalent that "in time" this proportion will rise, and that losses in attendance due to elevation of standards will eventually be "made up." There is no warrant for this belief. Institutions which have always, or long, operated on a high standard, and thus command an established public, find that expense tends to increase more rapidly than fee income. They persistently seek additional funds that may enable them to push ahead. The number of high standard schools supported will tend to be in some definite relation to the public need; there will be no such disproportion between number and need on a high, as there has been on the low, basis. In other words, the total enrolment will shrink; it will tend to concentrate in fewer schools. Under these circumstances schools which have long enjoyed a comparatively low-grade patronage must cut loose from their past, and begin to cultivate a new clientele. They will probably make slow headway in recovering from the initial shock. Most of them must expire or "merge" before their independent salvation can possibly be worked out. Our conclusion is that established schools, secure of their public on a sound basis, may count on fees to the extent of one-third to one-half of the expenditure required to conduct a good school of modern medicine; and that as the department becomes more homogeneously developed, the fees will tend to do even less.

It is interesting to compare this hypothetical budget as a whole, and by separate departments, with the actual outlay of our best schools. The Johns Hopkins most nearly represents desirable conditions; for there a teaching hospital belonging to the medical school is supported by adequate and separate endowment, so that clinical facilities impose no burden on the funds of the medical school proper. Moreover, there from the first clinical teachers have been salaried and, in a measure, withdrawn

from general practice. The actual cost of conducting the Johns Hopkins Medical School, with 297 students, is something over \$100,000 a year, not including, however, the salaries of clinical professors, which are in this case paid out of the hospital funds. Including these, the total outlay would considerably exceed our estimate. Tuition fees are about one-half of this amount. The Harvard budget runs higher, \$251,389, much more than double the income in fees from its 285 students; Michigan, with 389 students, spends \$83,000 on its department of medicine and surgery, and \$70,000 more on the university hospital; Columbia, with 312 students, requires \$239,072 for the College of Physicians and Surgeons, including the Sloane Maternity Hospital and the Vanderbilt Clinic; Cornell (207 students) expends \$209,888 at New York and \$32,840 more at Ithaca, and gets back \$24,410 in fees. The Toronto (592 students) medical budget is about \$85,000, as against \$64,500 received in fees; McGill (328 students), \$77,000, as against \$43,750 received in fees; the University of Minnesota, \$71,336, as against \$16,546 received in fees. More modest establishments, working towards the same ideals, make a similar exhibit: eighteen years ago the total budget of the Yale Medical School was \$10,000;¹ it is now \$43,311,—three times the amount received in tuition fees and confessedly inadequate to the aspirations and capacity of the medical faculty. Cornell spends at Ithaca, on a two-year course, \$32,840, not including the cost of heating, lighting, administration, etc.

Few of these institutions have developed all departments equally. Even the laboratory branches are not as yet all of the same type. Relatively few even of the best schools are able to cultivate pharmacology to any considerable extent; the same is true of preventive medicine. On the clinical side, makeshifts of which we cannot be too impatient are all but universal. In general, even where intelligent ideals prevail, resources do not suffice for an all-round organization. Wherever a department has been acceptably cared for, the expenditure is apt to exceed our schematic estimate:² Johns Hopkins now spends \$16,750 a year on anatomy, \$14,171 on pathology (not counting \$4791 spent on the clinical laboratory), \$13,246 on physiology and physiological chemistry. Columbia spends \$29,259 on anatomy, \$18,400 on pathology,³ \$17,838 on physiology. Cornell (New York) spends \$37,000 on pathology,⁴ histology, and bacteriology, \$15,895 on anatomy, \$14,940 on physiology. These appropriations are not extravagant. On the contrary, they are closely approached—sometimes exceeded—wherever modern methods are effectively employed: at Ithaca, Cornell (18 students) spends \$9500 on anatomy and \$13,500 on physiology and pharmacology; New York University (408 students) spends \$15,000 on pathology; Washington

¹ Graham Lusk: "Medical Education," *Journal Amer. Med. Assn.*, vol. lli. p. 1230.

² The budgets that follow are not exactly comparable, for the lines are not always drawn in exactly the same way. Nevertheless they represent nearly enough the same thing to illustrate the point under discussion. Unfortunately college accounting does not as yet enable us to say how much goes into ordinary undergraduate teaching, how much into research, etc.

³ Including clinical pathology, \$26,800.

⁴ Excluding clinical pathology.

University, St. Louis (178 students), spends \$9640 for anatomy, \$8550 for physiology and pharmacology; the University of Wisconsin (49 students) spends \$10,000 for anatomy and \$8100 for physiology. Anatomy costs the University of Michigan \$14,300 a year, and the University of Iowa \$13,525. Champions of cheapness allege that large sums are needed only for research, where medicine is taught to college graduates who afterwards practise in large cities; but Michigan and Iowa spend these sums in behalf of high school boys who after graduation from the medical school return to the simple surroundings amidst which they grew up. New York University operates also with high school boys, and is mainly a teaching school. Where clinical medicine is on the proper basis, the same result emerges: at Tulane, for example (439 students), the department, recently reorganized on modern lines, requires \$9100 for its support. The University of Michigan uses \$7830 in medicine, \$9405 in surgery. Every one of the important subjects must of course very soon be provided on an adequate scale; for in every acceptable medical school, though large individual variations must occur, the movement to treat the main clinical divisions similarly will not stop. A simple process of multiplication will then give the minimum cost of maintaining a medical establishment in which all the essential subjects are adequately, even though not homogeneously, developed. Endowment or taxation alone can meet this burden,—and endowment and taxation are feasible only if medical education is carried on not only in, but by the university. For of course a medical school supported by fees is just as fettered inside, as it would be outside, the university. Its ideals may be higher; its fee income may be more independently expended. But in no case are the fees adequate to support all the essential departments on a substantial basis. As a rule, these schools "feature" one or two branches; the others pine. The best developed departments show what all ought to be: pathology at New York University, anatomy at Jefferson Medical College, are really strong departments; they belong to institutions dependent on fees; but to provide them, other departments must be denied anything like equal opportunity to expand.

Of course it is not to be supposed that the most expensive teaching is the best; that a department that costs \$20,000 is necessarily twice as good as one that spends \$10,000; it may be both scientifically and pedagogically inferior. It remains true, however, that in general the equipment and conduct of laboratories are costly; that professorial salaries are rising; that a productive teacher needs competent assistants, expensive apparatus, material, etc., and a certain margin, in case an unforeseen turn necessitate an unusual outlay. The scientist financially hampered so as to be incapable of following out surprises may miss the most valuable result of his tedious labors.

Important is it to observe that the expense does not diminish *pari passu* with the attendance. The formation of two-year schools has recently proceeded apace, many of them feebly equipped and poorly sustained; their initial plant costs little; their

total budgets are but a few thousand dollars.¹ A few dollars are expended for books; animals are provided in a gingerly manner; pathological material is small in amount, and comes as a gratuity from distant schools whose needs have been previously supplied; apparatus barely suffices for routine work; no helpers relieve the single departmental teacher of menial drudgery. These schools are of course scientifically sterile; as such, they must rapidly become antiquated, for they are situated in out-of-the-way places and their staff has but little intercourse with active centers. It seems hardly justifiable to start such ventures merely to meet institutional competition. The two-year school can doubtless make good where, as in Wisconsin, liberal support overcomes at many points the defects due to isolation; the heavy charges incurred, however, ought to be seriously pondered by those whose less ample means forbid anything like so adequate an appropriation.

It is now clear that medicine cannot be, and is not, properly taught on the basis of receipts. We have at this date 30-odd schools, all university departments, whose annual budgets call for sums considerably in advance of their receipts from fees. As these institutions will in number and facilities undoubtedly soon be equal to the task of producing physicians enough to supply the need, the coil is tightening around schools not yet in position to devote even all their fees to instruction. Well known institutions can still be cited, whose instruction as offered costs the school less than the fees paid in,—a balance being available for buildings, improvements, or for debt originally incurred for plant. Large receipts mean in most instances² low standards,—standards below the four-year high school basis. In order to secure a balance, economies must be effected, as has been already pointed out, at the expense of teaching, by inadequate equipment, uneven development, lack of full-time professors, reliance upon necessarily incompetent student assistants, absence of helpers, employment of volunteers in the dispensary, etc. Tufts College Medical School, with an income of \$59,093, is paying off in annual instalments a debt incurred for the building it now occupies; Jefferson Medical College, with receipts of \$102,995, must incidentally accumulate a fund to retire a large mortgage. The medical department of Northwestern University must apply its surplus to the discharge of debts incurred for buildings and plant. Vanderbilt University, having invested \$83,000 in a medical department, compels the department out of its fees (about \$25,000 a year) to pay all its own running expenses, something on the original purchase price, and six per cent interest on the unpaid balance. The University of Maryland, the College of Physicians and Surgeons of Baltimore, the Starling-Ohio (Columbus), pursue substantially the same policy.

¹ The minimum outlay, ordinary working efficiency being considered, for a department of physiology is given on page 199. It is questionable whether just now an institution is justified in undertaking the work if it is unable to do more than this minimum. Only a decided probability of increased resources in the future warrants the step.

² Rush (Chicago) is the only exception. No other high standard school contains over 300 students; most of them have a comparatively small enrolment.

Of our 155 medical schools, 120-odd depend on fees alone. Of these, there are better and worse: the former using the fees as far as they go to provide either several laboratory branches decently, or two or three well; the latter devoting but a part, often a small part, of the fee income to pedagogical use, distributing the rest among the teachers, who are in such cases always practising physicians.

The ethics of the case are clear. Let us grant that in the hope of ultimately getting to a sounder basis, it may have been justifiable for the more prosperous fee-supported schools, whose total income is large enough to do something, to fight for survival. Surely they were, and are, morally bound meanwhile to furnish the best medical teaching procurable with such income as they enjoy. Their practitioner teachers were all the time profiting indirectly by their school connection; and this would suffice, if their motives were really as altruistic as is commonly alleged. Meanwhile, laboratories can be kept decent and laboratory teaching can as a rule be thorough only if full-time instructors are employed. These teachers have no income but their salaries. The medical school must therefore devote its fees primarily to paying them and to giving them the necessary facilities. Though the fee-supported school do this unreservedly, it will none the less omit part of its duty, because fees cannot support a complete set of laboratories efficiently organized. The school is therefore not justified in cutting out one or more of its possible laboratories in order to pay its clinical teachers. It must not only use its fees to pay for the right kind of laboratory instruction, but it must organize as many such laboratories as fees will support before paying anything to the clinical teachers, who profit indirectly nevertheless. A school may not be justified in existing even on this basis; that is, if the demand for doctors can be met by institutions that can do better for their students, there is no need to put up with even so altruistic a compromise. Surely an institution that is not willing to do so much as this has absolutely no defense unless a section is so hard run for doctors that it must take them on any terms upon which they can be procured. Such is not the case at this writing in any part of the United States or Canada. The younger men utilized in the dispensary ought probably to be treated on the same basis. For the dispensary is usually turned over to young men still struggling for a livelihood. A small annual stipend would go far to get from them the best service they are capable of rendering. To these two purposes the fee-supported school is in conscience bound to apply its income. As far as fees reach, orderly, even though modest, scientific departments and a well conducted dispensary service should be provided and paid for.

A few schools have squarely met their responsibility in this matter, and with results that prove them deserving of additional support. The medical department of Syracuse University has a total fee income of \$28,861, which is spent on the scientific branches; the plant is not elaborate, but it is effective, attractive, and conscientiously managed. Within less than a year, the medical department of the University of Pittsburgh has come under complete university control. Prior to that

time it was a highly prosperous concern to its managers; nowhere in the country were worse conditions found. Now, as then, the school has only its fees for support; but they have this year gone into laboratories instead of into professorial pockets: with a result that is hardly less than a transformation. Full-time professors of pathology, physiology, and other branches have brought order out of chaos. The entire atmosphere of the institution has been clarified: students may be found actually studying, in the room in which under other conditions last year "four dozen wooden chairs were broken up" in boisterous horse-play. The medical department of Boston University, with a total income of \$12,762, makes a decent and attractive showing in a simple way in its laboratories of bacteriology, pathology, physiology, etc. Highly creditable is the record of Meharry Medical College, the colored school at Nashville; for there the teachers, though practising physicians, are poor men: of the total income of \$23,946, the salary list gets only \$9665. A violent contrast is afforded by Shaw University (Raleigh, N. C.), another school for colored men, whose teachers are, however, white physicians: its income from fees is \$2846; a few contributions increase the total income (not counting the board of students) to \$4721; the teachers just referred to draw out \$4737. In consequence the school has practically no outfit.

In the majority of the larger schools dependent on fees, an opposite policy is pursued. The laboratories are slighted or starved; the dispensary is neglected in order that dividends or salaries, running sometimes as high as \$1000, may be paid to precisely those faculty members who need it least. The Albany Medical School—nominally affiliated with Union College—has a fee income of \$20,276. Associated with it is the Bender Laboratory, where practically all its laboratory teaching except chemistry and anatomy is carried on. The school appropriates niggardly sums to provide for the teaching of pathology and bacteriology by the overworked and under-helped chief of the Bender Laboratory; the laboratory has struggled hard, and not unsuccessfully, to be productive at the same time; but it has accomplished, whether in teaching or in research, but a fraction of what it would have achieved, had not a large part of the college receipts been distributed in sums approximating \$500 each to fifteen members of the school faculty. At Buffalo similar conditions exist. The dispensary is utterly neglected; some laboratory subjects are unprovided, others are slighted, in order that a "nominal" salary of \$1000 may be paid in real money to some of the leading practitioners in the town. This institution collects \$4608 in laboratory fees and spends \$1105 in carrying the laboratories on. Brooklyn fairly repeats Albany. There the Hoagland Laboratory relieves the Long Island College Hospital of certain subjects; the rest are omitted, for the fees that might furnish them are distributed among well-to-do clinical teachers. Bowdoin, with a total available income of \$15,230, appropriates \$200 for the maintenance of the bacteriological laboratory, \$50 for the physiological laboratory, \$200 for chemistry, and \$200 for books, as against \$12,225 for salaries to men, not one of whom gives his whole

time to medical education. At Halifax, the fee income is some \$5000 a year and the government makes an appropriation of \$1200,—a total of \$6200. The faculty apportions this sum as follows: three-fourths of the fees are divided among the teachers; one-fourth of the fees plus the government subsidy must carry all other expense,—heat, light, janitor service, laboratory maintenance: the disgraceful condition of the premises follows as a matter of course. The Hahnemann of Philadelphia, with estimated receipts of \$18,500, distributes \$11,000 among teaching practitioners and spends perhaps \$1500 on equipment and \$500 for laboratory material. Advertising and commencement exercises—the latter only another form of advertising—often cost these institutions more than their laboratories. One large eastern institution expends \$4700 on publicity, as against \$3500 on its laboratories; another—a New York school, this—\$1500 on publicity, \$1100 on laboratories; another, \$2100 on advertising, \$1160 on laboratories; another—this time in the south—\$1000 on advertising, \$500 on laboratories, “including repairs.”¹

The conclusion, then, is irresistible that these schools, far from being the benevolent enterprises that they are alleged to be, still “pay,” both directly and indirectly; nor can a genuine altruistic motive be made out for any medical school which does not consistently devote its entire income to providing decent facilities and adequate instruction in the laboratories, where the teachers, if competent, must rely wholly on their salaries. Clinical teachers ought undoubtedly be paid, but not out of fees at the expense of laboratories and laboratory men. Institutions that supplement their fee income out of special endowments or out of their general funds very properly go ahead to pay their clinical teachers; otherwise the practitioner teacher must be subordinated. That these schools have been persistently used for pecuniary advantage is clear when an inventory of their belongings is contrasted with the annual income that has in some cases been earned for many years. They have little or nothing to show in the way of equipment. The medical department of the University of Arkansas is thirty years old; its annual receipts are now \$14,100;² except for a small recent investment, it is practically bare. The medical department of Georgetown University (Washington, D.C.) has been in operation almost sixty years; its annual income is now estimated at \$11,000. Its plant can represent only a small fraction of its receipts during its lifetime. The Medical College of Georgia is seventy years old; it has accumulated no plant worthy the name. The medical department of the University of Oregon, started in 1887, with a present fee income of \$8000 and state aid of \$1000 a year, has only one small laboratory that represents any investment at all. The medical department of the University of Chattanooga—twenty-one years old—with an income now of \$4290, of which the dean draws \$1800, would not, if sold under

¹ Additional examples to prove that the schools are operated for the profit of their faculties may be given if necessary: University of Alabama, fee income \$19,788, salaries \$14,000; University of Vermont, fee income, \$22,730, salaries and dividends, \$17,489 (laboratories, supplies, etc., \$1941, publicity, \$1289).

² Estimated.

the hammer, bring \$500. The St. Louis College of Physicians and Surgeons, with an estimated income of \$16,035, cannot afford the simplest equipment for its squalid dispensary and its hopeless laboratories. The osteopaths bid fair to repeat the worst offenses of the medical practitioners: their schools are fairly booming. The receipts of the Kirksville institution probably reach \$89,600 a year. The instruction furnished is exceedingly cheap in quality. All in all, there are annually paid in the United States and Canada about \$3,000,000 in medical student fees. An equal sum has been paid annually for years. It is obvious that only a small part of the total fee income of our medical schools has been devoted to upbuilding and equipping the schools, though just the reverse is pretended. Undoubtedly, the disfavor with which educational benefactors have regarded medical education is justified by the mercenary record reflected in these figures. But it is highly important that henceforth distinctions be made.

There are in the United States and Canada 56¹ schools whose total annual available resources are below \$10,000 each,—so small a sum that the endeavor to do anything substantial with it is of course absurdly futile; a fact which is usually made an excuse for doing nothing at all, not even washing the windows, sweeping the floor, or providing a disinfectant for the dissecting-room. There is not a shred of justification for their continuance: for even if there were need of several thousand doctors annually, the wretched contribution made by these poverty-stricken schools could well be spared. Among them may be mentioned the California Eclectic (Los Angeles), estimated income \$1060; Pulte Medical College (Cincinnati), estimated income \$1325; Toledo Medical College, with \$3240; Willamette University, with \$3580; and Southwestern Homeopathic College, with \$1100.

Responsibility for the conditions described does not rest on medical men alone; colleges and universities have not infrequently become accessory after the fact. We have repeatedly urged that the proper place for a medical school is within a university; but there is no saving grace in the mere name. Three services may be specified as comprised in the duty of a university which makes itself responsible for a medical school: the definition and enforcement of entrance standards, the upholding of scientific ideals, and responsibility for adequate support. We have mentioned universities that fail in the first or the second or in both; and as a rule these are the institutions that fail likewise in the third. Of the 155 medical schools of the continent, 82 are university departments, actual or so-called. With few exceptions the connection of these universities with medical education began at a time when no one took obligations in the matter seriously. Some of those that entered the field thus lightly have made amends. Others, awakening late to a sense of their obligations, are confronted by an apparently hopeless situation. Their total annual income would not alone suffice for a good medical school,—and it must carry the burden of the entire

¹There are thirteen more whose fee income is likewise below \$10,000 apiece, but they are university departments whose budgets, greatly in excess of fees, are carried by the respective universities.

institution. Their medical departments will, unless discontinued, prove sources of weakness and reproach, until their income is augmented far beyond their immediate expectations. As a matter of fact, few university administrators yet grasp clearly the fundamental principles of modern medical education. Twenty-seven colleges and universities of the United States and Canada have nominal or affiliated medical departments which they do not control and which they do not help to support. The state universities of Arkansas, Georgia, Illinois, and Oregon are in this position. Among endowed institutions that lend their names to proprietary medical schools, for which they can hope to do nothing and which they cannot possibly control as long as they do nothing, are the University of Denver, Washburn College, Cotner University, Epworth, Baylor, Western, and Dalhousie Universities. Some of these institutions are very poor. Among those that are capable of leading respectable lives as colleges, but are little less than absurd as universities, may be mentioned Union University, in New York state, which is the appellation given to the superficial combination of Union College and the Albany Law and Medical Schools. The chancellor of the University of Denver, — a Methodist institution, — affiliated with the Denver and Gross Medical College, finds a strange reason for self-congratulation in the connection. "The University of Denver," he says in a recent report, "has always had a form of organization that is peculiar to itself. From the beginning the professional schools have had autonomous life. The church has never expended one penny for equipment or for buildings or for maintenance of the professional schools. . . . It has made a notable extension of its influence in very many ways through the professional schools of the university without the expenditure of a penny for any purpose whatsoever." A highly diverting illustration of the seriousness with which these ties are regarded has been recently furnished at Los Angeles; there a local school, affiliated with the University of Southern California, saw a chance of improving its lot by contracting an alliance with the University of California. A divorce was speedily agreed on, and the University of California, protected by contract, however, against any expenditure for two years, promptly became sponsor for a second clinical school. The University of Southern California, however, enjoyed only a brief widowhood. Into the vacant place, the Los Angeles College of Physicians and Surgeons promptly stepped. The University of Southern California was thus again made whole by the addition of a medical department which, enjoying an estimated total fee income of \$4075, will ask nothing for support and still less for supervision.

The strength of the argument advanced in this chapter is not dependent on the absolute accuracy of the figures cited. Actual income may vary from our estimates a few thousand dollars up or down; we may have failed to consider this offset or that. It has been, as a matter of fact, utterly impossible to get figures that represent exactly the same items in all, or even in many, institutions. An improvement in institutional book-keeping would have to be effected in order to make accurate comparison possible. None the less, the picture is on the whole fair and reliable. Medi-

cine is expensive to teach. It can in no event be taught out of fees. Reputable institutions with no other outlook should combine with better favored schools or stop outright. Legal enactment should terminate the career of the others. Abundant benefaction should strengthen up to our need the relatively small number of schools required to deal effectively with the subject. No greater error can be made than to suppose that endowment and university ideals are necessary only to medical schools with high entrance standards. Vanderbilt and Tulane, trying to make intelligent physicians out of high school boys in the south, need the same means and ideals as Harvard and Johns Hopkins, working with college material in another section. Indeed, the more defective the material or the more unfavorable the environment, the greater must be the resources and the higher must be the purposes of those who have undertaken to look after this vital social function.

CHAPTER IX

RECONSTRUCTION

THE necessity of a reconstruction that will at once reduce the number and improve the output of medical schools may now be taken as demonstrated. A considerable sloughing off has already occurred. It would have gone further but for the action of colleges and universities which have by affiliation obstructed nature's own effort at readjustment. Affiliation is now in the air. Medical schools that have either ceased to prosper, or that have become sensitive to the imputation of proprietary status or commercial motive, seek to secure their future or to escape their past by contracting an academic alliance. The present chapter undertakes to work out a schematic reconstruction which may suggest a feasible course for the future. It is not supposed that violent measures will at once be taken to reconstitute the situation on the basis here worked out. A solution so entirely suggested by impersonal considerations may indeed never be reached. But legislators and educators alike may be assisted by a theoretical solution to which, as specific problems arise, they may refer.

This solution deals only with the present and the near future,—a generation, at most. In the course of the next thirty years needs will develop of which we here take no account. As we cannot foretell them, we shall not endeavor to meet them. Certain it is that they will be most effectively handled if they crop up freely in an unencumbered field. It is therefore highly undesirable that superfluous schools now existing should be perpetuated in order that a subsequent generation may find a means of producing its doctors provided in advance. The cost of prolonging life through this intervening period will be worse than wasted; and an adequate provision at that moment will be embarrassed by inheritance and tradition. Let the new foundations of that distant epoch enjoy the advantage of the Johns Hopkins, starting without handicap at the level of the best knowledge of its day.

The principles upon which reconstruction would proceed have been established in the course of this report: (1) a medical school is properly a university department; it is most favorably located in a large city, where the problem of procuring clinical material, at once abundant and various, practically solves itself. Hence those universities that have been located in cities can most advantageously develop medical schools. (2) Unfortunately, however, our universities have not always been so placed. They began in many instances as colleges or something less. Here a supposed solicitude for youth suggested an out-of-the-way location; elsewhere political bargaining brought about the same result. The state universities of the south and west, most likely to enjoy sufficient incomes, are often unfortunately located: witness the University of Alabama at Tuscaloosa, of Georgia at Athens, of Mississippi at Oxford, of Missouri at Columbia, of Arkansas at Fayetteville, of Kansas at Lawrence, of South Dakota at Vermilion; and that experience has taught us nothing is proved by the

recent location of the State University of Oklahoma at Norman. Some of these institutions are freed from the necessity of undertaking to teach medicine by an endowed institution better situated; in other sections the only universities fitted by their large support and their assured scientific ideals to maintain schools of medicine are handicapped by inferiority of location. We are not thereby justified in surrendering the university principle. Experience, our own or that of Germany, proves, as we have already pointed out, that the difficulty is not insuperable. At relatively greater expense, it is still feasible to develop a medical school in such an environment: there is no magnet like reputation; nothing travels faster than the fame of a great healer; distance is an obstacle readily overcome by those who seek health. The poor as well as the rich find their way to shrines and healing springs. The faculty of medicine in these schools may even turn the defect of situation to good account; for, freed from distraction, the medical schools at Iowa City and Ann Arbor may the more readily cultivate clinical science. An alternative may indeed be tried in the shape of a remote department. The problem in that case is to make university control real, to impregnate the distant school with genuine university spirit. The difficulty of the task may well deter those whose resources are scanty or who are under no necessity of engaging in medical teaching. As we need many universities and but few medical schools, a long-distance connection is justified only where there is no local university qualified to assume responsibility. A third solution—division—may, if the position taken in previous chapters is sound, be disregarded in the final disposition.¹

(3) We shall assign only one school to a single town. As a matter of fact, no American city now contains more than one well supported university,²—and if we find it unnecessary or impolitic to duplicate local university plants, it is still less necessary to duplicate medical schools. The needless expense, the inevitable shrinkage of the student body, the difficulty of recruiting more than one faculty, the disturbance due to competition for hospital services, argue against local duplication. It is sometimes contended that competition is stimulating: Tufts claims to have waked up Harvard; the second Little Rock school did undoubtedly move the first to spend several hundred dollars on desks and apparatus. But competition may also be demoralizing; the necessity of finding students constitutes medical schools which ought to elevate standards the main obstacles to their elevation: witness the attitude of several institutions in Boston, New York, Philadelphia, Baltimore, and Chicago. Moreover, local competition is a stimulus far inferior to the general scientific competition to which all well equipped, well conducted, and rightly inspired university departments throughout the civilized world are parties. The English have experimented with both forms,—a single school in the large provincial towns, a dozen or more in London,—and their experience inclines them to reduce as far as possible

¹ We shall omit the half-school because it may be considered to divide with the whole school the work of the first two years; it does not greatly affect the clinical output, with which this chapter is mainly concerned.

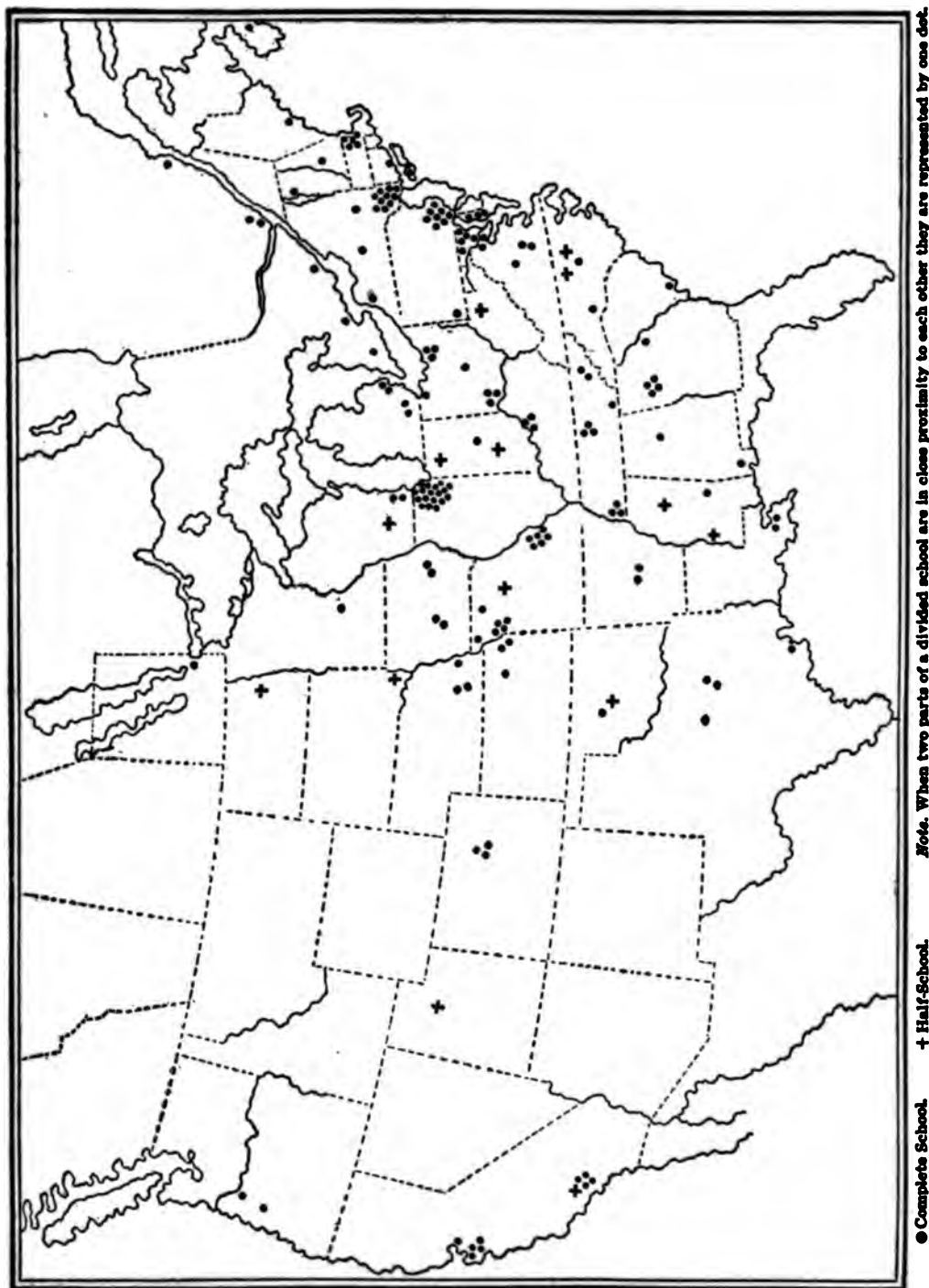
² Chicago is almost an exception, as Northwestern University is situated at Evanston, a suburb.

the number of the London schools. Amalgamation has already taken place in certain American towns: the several schools of Cincinnati, of Indianapolis, and of Louisville have all recently "merged." This step is easy enough in towns where there is either no university or only one university. Where there are several, as in Chicago, Boston, and New York, the problem is more difficult. Approached in a broad spirit it may, however, prove not insoluble; coöperation may be arranged where several institutions all possess substantial resources; universities of limited means can retire without loss of prestige,—on the contrary, the respect in which they are held must be heightened by any action dictated by conscientious refusal to continue a work that they are in no position to do well.

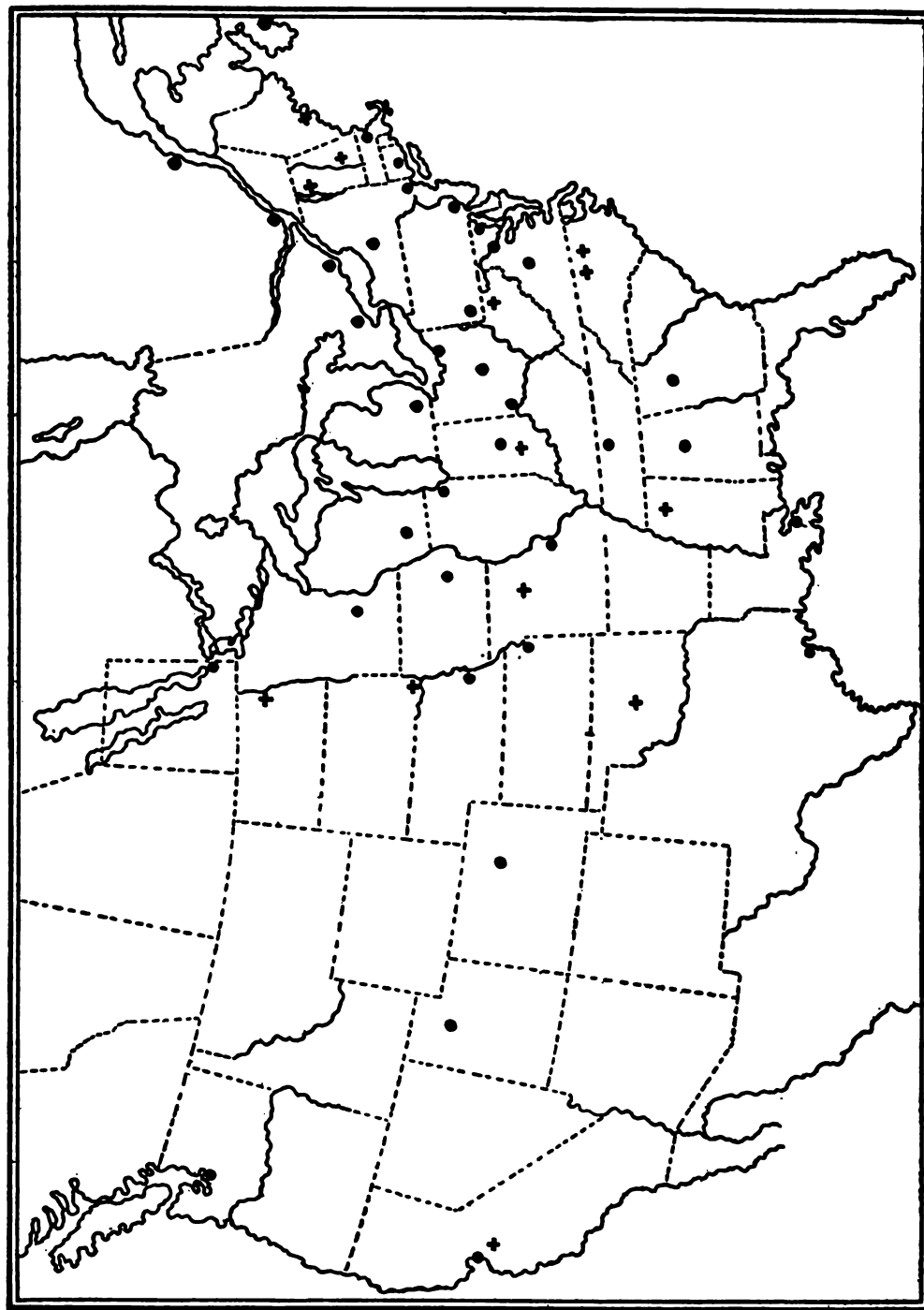
(4) A reconstruction of medical education cannot ignore the patent fact that students tend to study medicine in their own states, certainly in their own sections. In general, therefore, arrangements ought to be made, as far as conditions heretofore mentioned permit, to provide the requisite facilities within each of the characteristic state groups. There is the added advantage that local conditions are thus heeded and that the general profession is at a variety of points penetrated by educative influences. New Orleans, for example, would cultivate tropical medicine; Pittsburgh, the occupational diseases common in its environment. In respect to output, we may once more fairly take existing conditions into account. We are not called on to provide schools enough to keep up the present ratio. As we should in any case hardly be embarrassed for almost a generation in the matter of supply, we shall do well to produce no doctors who do not represent an improvement upon the present average.

The principles above stated have been entirely disregarded in America. Medical schools have been established regardless of need, regardless of the proximity of competent universities, regardless of favoring local conditions. An expression of surprise at finding an irrelevant and superfluous school usually elicits the reply that the town, being a "gateway" or a "center," must of course harbor a "medical college." It is not always easy to distinguish "gateway" and "center:" a center appears to be a town possessing, or within easy reach of, say 50,000 persons; a gateway is a town with at least two railway stations. The same place may be both,—in which event the argument is presumably irrefragable. Augusta, Georgia, Charlotte, North Carolina, and Topeka, Kansas, are "centers," and as such are logical abodes of medical instruction. Little Rock, St. Joseph, Memphis, Toledo, Buffalo, are "gateways." The argument, so dear to local pride, can best be refuted by being pursued to its logical conclusion. For there are still forty-eight towns in the United States with over 50,000 population each, and no medical schools: we are threatened with forty-eight new schools at once, if the contention is correct. The truth is that the fundamental, though of course not sole, consideration is the university, provided its resources are adequate; and we have fortunately enough strong universities, properly distributed, to satisfy every present need without serious sacrifice of sound principle. The Ger-

I. MAP SHOWING THE ACTUAL NUMBER, LOCATION, AND DISTRIBUTION OF MEDICAL SCHOOLS



II. MAP SHOWING THE SUGGESTED NUMBER, LOCATION, AND DISTRIBUTION OF MEDICAL SCHOOLS



● Complete School.
+ Half-School.

have been arranged in this way. The fundamental principles of faculty organization are thus sacrificed. Unless combination is to destroy organization, titles must be shaved when schools unite. There must be one professor of medicine, one professor of surgery, etc., to whom others are properly subordinated. What with superabundant professorial appointments, due now to desire to annex another hospital, and again to annexation of another school, faculties have become unmanageably large, viewed either as teaching, research, or administrative bodies.

✓ Reduction of our 155 medical schools to 31 would deprive of a medical school no section that is now capable of maintaining one. It would threaten no scarcity of physicians until the country's development actually required more than 3500 physicians annually, that is to say, for a generation or two, at least. Meanwhile, the outline proposed involves no artificial standardization: it concedes a different standard to the south as long as local needs require; it concedes the small town university type where it is clearly of advantage to adhere to it; it varies the general ratio in thinly settled regions; and, finally, it provides a system capable without overstraining of producing twice as many doctors as we suppose the country now to need. In other words, we may be wholly mistaken in our figures without in the least impairing the feasibility of the kind of renovation that has been outlined; and every institution arranged for can be expected to make some useful contribution to knowledge and progress.

The right of the state to deal with the entire subject in its own interest can assuredly not be gainsaid. The physician is a social instrument. If there were no disease, there would be no doctors. And as disease has consequences that immediately go beyond the individual specifically affected, society is bound to protect itself against unnecessary spread of loss or danger. It matters not that the making of doctors has been to some extent left to private institutions. The state already makes certain regulations; it can by the same right make others. Practically the medical school is a public service corporation. It is chartered by the state; it utilizes public hospitals on the ground of the social nature of its service. The medical school cannot then escape social criticism and regulation. It was left to itself while society knew no better. But civilization consists in the legal registration of gains won by science and experience; and science and experience have together established the terms upon which medicine can be most useful. "In the old days," says Metchnikoff,¹ "anyone was allowed to practise medicine, because there was no medical science and nothing was exact. Even at the present time among less civilized people, any old woman is allowed to be a midwife. Among more civilized races, differentiation has taken place and childbirths are attended by women of special training who are midwives by diploma. In case of nations still more civilized, the trained midwives are directed by obstetric physicians who have specialized in the conducting of labor. This high degree of differentiation has arisen with and has itself aided the progress of obstetrical science." Legislation

¹ *The Nature of Man* (translated by Chalmers), p. 300.

which should procure for all the advantage of such conditions as is now possible would speedily bring about a reconstruction quite as extensive as that described.

Such control in the social interest inevitably encounters the objection that individualism is thereby impaired. So it is, at that level; so it is intended. The community through such regulation undertakes to abridge the freedom of particular individuals to exploit certain conditions for their personal benefit. But its aim is thereby to secure for all others more freedom at a higher level. Society forbids a company of physicians to pour out upon the community a horde of ill trained physicians. Their liberty is indeed clipped. As a result, however, more competent doctors being trained under the auspices of the state itself, the public health is improved; the physical well-being of the wage-worker is heightened; and a restriction put upon the liberty, so-called, of a dozen doctors increases the effectual liberty of all other citizens. Has democracy, then, really suffered a set-back? Reorganization along rational lines involves the strengthening, not the weakening, of democratic principle, because it tends to provide the conditions upon which well-being and effectual liberty depend.

CHAPTER X

THE MEDICAL SECTS

In the reconstruction just sketched, no allusion has been made to medical sectarianism. We have considered the making of doctors and the increase of knowledge; allopathy, homeopathy, osteopathy, have cut no figure in the discussion. Is it essential that we should now conclude a treaty of peace, by which the reduced number of medical schools shall be so pro-rated as to recognize dissenters on an equitable basis?

The proposition raises at once the question as to whether in this era of scientific medicine, sectarian medicine is logically defensible; as to whether, while it exists, separate standards, fixed by the conditions under which it can survive, are justifiable. Prior to the placing of medicine on a scientific basis, sectarianism was, of course, inevitable. Every one started with some sort of preconceived notion; and from a logical point of view, one preconception is as good as another. Allopathy was just as sectarian as homeopathy. Indeed, homeopathy was the inevitable retort to allopathy. If one man "believes" in dissimilars, contrary suggestion is certain to provide another who will stake his life on similars; the champion of big doses will be confronted by the champion of little ones. But now that allopathy has surrendered to modern medicine, is not homeopathy borne on the same current into the same harbor?

The modern point of view may be restated as follows: medicine is a discipline, in which the effort is made to use knowledge procured in various ways in order to effect certain practical ends. With abstract general propositions it has nothing to do. It harbors no preconceptions as to diseases or their cure. Instead of starting with a finished and supposedly adequate dogma or principle, it has progressively become less cocksure and more modest. It distrusts general propositions, *a priori* explanations, grandiose and comforting generalizations. It needs theories only as convenient summaries in which a number of ascertained facts may be used tentatively to define a course of action. It makes no effort to use its discoveries to substantiate a principle formulated before the facts were even suspected. For it has learned from the previous history of human thought that men possessed of vague preconceived ideas are strongly disposed to force facts to fit, defend, or explain them. And this tendency both interferes with the free search for truth and limits the good which can be extracted from such truth as is in its despite attained.

Modern medicine has therefore as little sympathy for allopathy as for homeopathy. It simply denies outright the relevancy or value of either doctrine. It wants not dogma, but facts. It countenances no presupposition that is not common to it with all the natural sciences, with all logical thinking.

The sectarian, on the other hand, begins with his mind made up. He possesses in advance a general formula, which the particular instance is going to illustrate, verify,

reaffirm, even though he may not know just how. One may be sure that facts so read will make good what is expected of them; that only that will be seen which will sustain its expected function; that every aspect noted will be dutifully loyal to the revelation in whose favor the observer is predisposed: the human mind is so constituted.

It is precisely the function of scientific method—in social life, politics, engineering, medicine—to get rid of such hindrances to clear thought and effective action. For it, comprehensive summaries are situate in the future, not in the past; we shall attain them, if at all, at the end of great travail; they are not lightly to be assumed prior to the beginning. Science believes slowly; in the absence of crucial demonstration its mien is humble, its hold is light. "One should not teach dogmas; on the contrary, every utterance must be put to the proof. One should not train disciples but form observers: one must teach and work in the spirit of natural science."¹

Scientific medicine therefore brushes aside all historic dogma. It gets down to details immediately. No man is asked in whose name he comes—whether that of Hahnemann, Rush, or of some more recent prophet. But all are required to undergo rigorous cross-examination. Whatsoever makes good is accepted, becomes in so far part, and organic part, of the permanent structure. To plead in advance a principle couched in pseudo-scientific language or of extra-scientific character is to violate scientific quality. There is no need, just as there is no logical justification, for the invocation of names or creeds, for the segregation from the larger body of established truth of any particular set of truths or supposed truths as especially precious. Such segregation may easily invest error with the sanctity of truth; it will certainly result in conferring disproportionate importance upon the fact or procedure marked out as of pivotal significance. The tendency to build a system out of a few partially apprehended facts, deductive inference filling in the rest, has not indeed been limited to medicine, but it has nowhere else had more calamitous consequences.

The logical position of medical sectarians to-day is self-contradictory. They have practically accepted the curriculum as it has been worked out on the scientific basis. They teach pathology, bacteriology, clinical microscopy. They are thereby committed to the scientific method; for they aim to train the student to ascertain and interpret facts in the accepted scientific manner. He may even learn his sciences in the same laboratory as the non-sectarian. But scientific method cannot be limited to the first half of medical education. The same method, the same attitude of mind, must consistently permeate the entire process. The sectarian therefore in effect contradicts himself when, having pursued or having agreed to pursue the normal scientific curriculum with his student for two years, he at the beginning of the third year produces a novel principle and requires that thenceforth the student effect a compromise between science and revelation.

¹Johannes Orth: *Berliner Klinische Wochenschrift*, vol. xliii. p. 818.

Once granted the possibility of medical dogma, there can be no limit to the number of dissenting sects. As a matter of fact, only three or four are entitled to serious notice in an educational discussion. The chiropractics, the mechano-therapists, and several others are not medical sectarians, though exceedingly desirous of masquerading as such; they are unconscionable quacks, whose printed advertisements are tissues of exaggeration, pretense, and misrepresentation of the most unqualifiedly mercenary character. The public prosecutor and the grand jury are the proper agencies for dealing with them.

Sectarians, in the logical sense above discussed, are (1) the homeopaths, (2) the eclectic, (3) the physiomedicals, (4) the osteopaths. All of them accept in theory, at least, the same fundamental basis. They admit that anatomy, pathology, bacteriology, physiology, must form the foundation of a medical education, to use the words broadly so as to include all varieties of therapeutic procedure. They offer no alternative to pathology or physiology; there is, they concede, only one proper science of the structure of the human body, of the abnormal growths that afflict it. So far, they make no issue as against scientific medicine. Much is involved in agreement up to this point. The standards of admission to the medical school, the facilities which the schools must furnish in order effectively to teach the fundamental branches, are the same for all alike. A student of homeopathy or of osteopathy needs to be just as intelligent and mature as a student of scientific medicine; and he is no easier to teach; for during the first and second years, at least, he is supposed to be doing precisely the same things.

At the beginning of the clinical years, the sectarian interposes his special principle. But educationally, the conditions he needs thenceforth do not materially differ from those needed by consistently scientific medicine. Once more, whatever the arbitrary peculiarity of the treatment to be followed, the student cannot be trained to recognize clinical conditions, to distinguish between different clinical conditions, or to follow out a line of treatment, except in the ways previously described in dealing with scientific medicine. He must see patients and must follow their progress, so as to discover what results take place in consequence of the specific measures employed. A sectarian institution, being a school in which students are trained to do particular things, needs the same resources and facilities on the clinical side as a school of scientific medicine.

Sectarian institutions do not exist in Canada; in the United States there are 32 of them, of which 15 are homeopathic, 8 eclectic, 1 physiomedical, and 8 osteopathic. Without attempting to indicate the peculiar tenets of each, we shall briefly review them as schools, seeking to ascertain how far they are in position effectively to teach, quite regardless of the individual doctrine each sect may desire to promote.

None of the fifteen homeopathic schools¹ requires more than a high school educa-

¹Hahnemann (San Francisco), Hahnemann and Hering (Chicago), state universities of Iowa and Michigan, Southwestern Homeopathic (Louisville), Boston University, Detroit Homeopathic, Kan-

tion for entrance; only five¹ require so much. The remaining eleven get less,—how much less depending on their geographical locations rather than on the school's own definition. The Louisville, Kansas City, and Baltimore schools cannot be said to have admission standards in any strict sense at all; Pulte at Cincinnati is bound to be careful in dealing with Ohio candidates: outsiders are responsible for themselves. The minimum at Boston University, to judge from the examinations which, in default of acceptable credentials, the candidate must pass, covers less than two years of a good high school course.

On the laboratory side, though the homeopaths admit the soundness of the scientific position, they have taken no active part in its development. Nowhere in homeopathic institutions, with the exception of one or two departments at Boston University, is there any evidence of progressive scientific work. Even "drug proving" is rarely witnessed. The fundamental assumption of the sect is sacred; and scientific activity cannot proceed where any such interdict is responsible for the spirit of the institution. The homeopathic departments at Iowa and Michigan are in this respect only half-schools,—clinical halves. For their students get their scientific instruction in pathology, anatomy, etc., in the only laboratories which the university devotes to those subjects, under men none of whom sympathizes with homeopathy. Their disadvantage is increased by the fact that the instruction is adapted to students who have had one or two years of college work. The general argument in favor of higher standards is here reinforced by the consideration that the homeopathic students should certainly qualify themselves for the only grade of scientific instruction that the two universities offer.

Of complete homeopathic schools, Boston University, the New York Homeopathic College, and the Hahnemann of Philadelphia alone possess the equipment necessary for the effective routine teaching of the fundamental branches. None of them can employ full-time teachers to any considerable extent. But they possess fairly well-equipped laboratories in anatomy, pathology, bacteriology, and physiology,² a museum showing care and intelligence, and a decent library. Boston University deserves especial commendation for what it has accomplished with its small annual income.

Of the remaining homeopathic schools, four are weak and uneven: the Hahnemann of San Francisco and the Hahnemann of Chicago have small, but not altogether inadequate, equipment for the teaching of chemistry, elementary pathology and bacteriology; the Cleveland school offers an active course in experimental physiology. Beyond ordinary dissection and elementary chemistry, they offer little else. There is, for example, no experimental physiology in the San Francisco Hahnemann: "the instructor does n't believe in it;" the Chicago Hahnemann contains a small outfit and

sas City (Kansas) Hahnemann, New York Medical College for Women, New York Homeopathic, Pulte (Cincinnati), Cleveland Homeopathic, Hahnemann (Philadelphia), Atlantic Medical (Baltimore).

¹ State universities of Iowa and Michigan, Detroit Homeopathic, and the two New York schools.

² The Philadelphia Hahnemann is defective in experimental physiology.

a few animals for that subject; the Cleveland equipment for pathology and bacteriology is meager. The New York Homeopathic College for Women is well intentioned, but its means have permitted it to do but little in any direction.

Six schools remain—all utterly hopeless: Hering (Chicago), because it is without plant or resources; the other five,¹ because in addition to having nothing, their condition indicates the total unfitness of their managers for any sort of educational responsibility. The buildings are filthy and neglected. At Louisville no branch is properly equipped; in one room, the outfit is limited to a dirty and tattered manikin; in another, a single guinea pig awaits his fate in a cage. At Detroit the dean and secretary “have their offices downtown;” the so-called laboratories are in utter confusion. At Kansas City similar disorder prevails. At the Atlantic Medical appearances are equally bad; to make matters worse, the school has lately omitted the word “homeopathic” from its title so as to gather in students dropped from other Baltimore schools.

In respect to hospital facilities, the University of Michigan, Boston University, and the New York Homeopathic alone command an adequate supply of material, under proper control, though modern teaching methods are not thoroughly utilized even by them. The Iowa school controls a small, but inadequate, hospital. All the others are seriously handicapped by either lack of material or lack of control, and in most instances by both. The Hahnemann of San Francisco relies mainly on 80 beds supported by the city and county in a private hospital; the Detroit school is cordially welcome at the Grace Hospital, but less than 60 beds are available, and they are mostly surgical; the Woman's Homeopathic of New York² controls a hospital of 35 available beds, mostly surgical; the Southwestern (Louisville) and the Cleveland school get one-fifth of the patients that enter the city hospitals of their respective towns, but these hospitals are not equipped or organized with a view to teaching. The Kansas City school holds clinics one day a week at the City Hospital; Pulte (Cincinnati) and the Atlantic (Baltimore) have, as nearly as one can gather, nothing definite at all. Several of the schools appear to be unnecessarily handicapped. The Chicago Hahnemann adjoins a hospital with 60 ward beds. But as the superintendent “does n't believe in admitting students to wards,” there is little or nothing beyond amphitheater teaching. A bridge connects Hering (Chicago) with a homeopathic hospital, but “students are not admitted.” The Cleveland school is next door to a hospital with which it was once intimate; their relations have been ruptured. An excellent hospital is connected with the building occupied by the Philadelphia Hahnemann, but there is no ward work.

The dispensary situation is rather worse. Iowa and Ann Arbor have little opportunity. Of the others, Boston University alone has a really model dispensary, comparing favorably in equipment, organization, and conduct with the best institutions

¹Southwestern (Louisville), Pulte (Cincinnati), Atlantic (Baltimore), and the Detroit and Kansas City schools.

²This school has scattered supplementary facilities, as is the way of New York schools.

of the kind in the country. The New York Homeopathic, the Chicago Hahnemann, and the Philadelphia Hahnemann command material enough. The others lack material, equipment, or care; in some instances,—Atlantic Medical, Pulte, Detroit, Kansas City,—they lack everything that a dispensary should possess.

Financially, the two state university departments and the New York Homeopathic school are the only homeopathic schools whose strength is greater than their fee income. All the others are dependent on tuition. Their outlook for higher entrance standards or improved teaching is, therefore, distinctly unpromising. Only a few of them command tuition fees enough to do anything at all: the Chicago Hahnemann, Boston University, and the Philadelphia Hahnemann, with annual fees ranging between \$12,000 and \$18,000.¹ Nine of them are hopelessly poor: the San Francisco Hahnemann, Hering (Chicago), the Detroit Homeopathic, and the Atlantic Medical operate on less than \$4000¹ a year; the Southwestern (Louisville) and Pulte (Cincinnati) on less than \$1500.¹

In the year 1900 there were twenty-two homeopathic colleges in the United States; to-day there are fifteen; the total student enrolment has within the same period been cut almost in half, decreasing from 1909 to 1009;² the graduating classes have fallen from 413 to 246. As the country is still poorly supplied with homeopathic physicians, these figures are ominous; for the rise of legal standard must inevitably affect homeopathic practitioners. In the financial weakness of their schools, the further shrinkage of the student body will inhibit first the expansion, then the keeping up, of the sect.

Logically, no other outcome is possible. The ebbing vitality of homeopathic schools is a striking demonstration of the incompatibility of science and dogma. One may begin with science and work through the entire medical curriculum consistently, exposing everything to the same sort of test; or one may begin with a dogmatic assertion and resolutely refuse to entertain anything at variance with it. But one cannot do both. One cannot simultaneously assert science and dogma; one cannot travel half the road under the former banner, in the hope of taking up the latter, too, at the middle of the march. Science, once embraced, will conquer the whole. Homeopathy has two options: one to withdraw into the isolation in which alone any peculiar tenet can maintain itself; the other to put that tenet into the melting-pot. Historically it undoubtedly played an important part in discrediting empirical allopathy. But laboratories of physiology and pharmacology are now doing that work far more effectively than homeopathy; and they are at the same time performing a constructive task for which homeopathy, as such, is unfitted. It will be clear, then, why, when outlining a system of schools for the training of physicians on scientific lines, no specific provision is made for homeopathy. For everything of proved value in

¹ Estimated.

² *Journal of the American Institute of Homeopathy*, vol. I., 1909, no. 11, p. 537. *The Journal of the American Medical Association*, Aug. 14, 1909 (pp. 556, 557), gives figures somewhat lower: 989 instead of 1009; 209 instead of 246. The discrepancy does not alter our interpretation.

homeopathy belongs of right to scientific medicine and is at this moment incorporate in it; nothing else has any footing at all, whether it be of allopathic or homeopathic lineage. "A new school of practitioners has arisen," says Dr. Osler, "which cares nothing for homeopathy and less for so-called allopathy. It seeks to study, rationally and scientifically, the action of drugs, old and new."¹

There are eight eclectic schools.² One of them — that in New York City — requires the Regents' Medical Student Certificate, *i. e.*, a four-year high school education, for admission; the Cincinnati school must require an equal preliminary education of students expecting to practise in Ohio, others taking the matter into their own hands. Just how the instruction is thus accommodated to various levels is not clear. The remaining six schools have either nominal requirements or none at all.

None of the schools has anything remotely resembling the laboratory equipment which all claim in their catalogues. The Cincinnati institution possesses a new and attractive building, thus far meagerly fitted out; the New York school has a clean building with a chemical laboratory in which elementary chemistry can be and apparently is taught properly. It has little else: a small room for the microscopic subjects, but no adequate equipment for teaching them; a few thousand books, mostly old; a few models, a lantern, etc., — and this is most satisfactorily equipped of all the eclectic institutions. The Hospital School at Atlanta, starting on four weeks' notice, had time to get students, but not to get means of teaching them. The private laboratory of the instructor in pathology and bacteriology was meanwhile at their service: other equipment there was, at the time of the visit, none.

The remaining five eclectic schools are without exception filthy and almost bare. They have at best grimy little laboratories for elementary chemistry, a few microscopes, some bottles containing discolored and unlabeled pathological material, an incubator out of commission, and a horrid dissecting-room, — when dissecting is in progress. The St. Louis school was the proud possessor of some new physiological apparatus, the state board having recently issued an edict requiring its purchase; but there was no place to use it and no sign of its use. The Kansas City institution had likewise made a recent investment to the same extent, having just taken on the faculty the "laboratory man" of the local homeopathic and osteopathic schools. The other Atlanta, the Los Angeles, and the Lincoln schools have even less. The Lincoln institution alleges that its scientific training is given at Cotner University, where the only material available for medical instruction consists of a chemical laboratory, some microscopes, and a small collection of stuffed birds.

Of the eight schools under discussion, none has decent clinical opportunities. The New York school can send three students twice weekly to the Sydenham Hospital; the Cincinnati school is affiliated with the Seton Hospital, with 24 available beds,

¹ *Loc. cit.*, p. 268.

² One each at Los Angeles, Kansas City (Kansas), St. Louis, Lincoln (Nebraska), Cincinnati, New York City, and two at Atlanta.

80 to 90 per cent surgical, and can send its men to look on at the public clinics given in the City Hospital; the St. Louis students have a day a week at the City Hospital and profit occasionally elsewhere through professorial connection. All this is criminally inadequate, yet it is the best that the eclectics offer; for the other five schools have literally nothing at all. One of the Atlanta "colleges" is connected with a private infirmary; the other has not even such a semblance. The Los Angeles school claims "private hospitals only;" the Kansas City school claims to give clinics at the new City Hospital, but the hospital authorities deny it. At Lincoln "there are no regular hours at any hospital; they depend on cases as they turn up."

The dispensaries may be even more briefly described. The Atlanta, Lincoln, and Los Angeles schools have none at all. The Cincinnati school uses poorly the small dispensary at the Seton Hospital. The New York school has three rooms in its own building and access to another dispensary. At St. Louis there is one room and "some one comes almost every day;" at Kansas City, one room likewise, with a present daily attendance of three and a confident aspiration that this number can be swelled to six.

The utter hopelessness of the future of these schools is apparent on a glance at their financial condition. All are dependent on fees. Only three of them—the New York, the Cincinnati, and one Atlanta school—enjoy an income between \$5000 and \$8500¹ a year; the St. Louis, Lincoln, and second Atlanta schools have something over \$3000¹ annually; those at Los Angeles and Kansas City not much above \$1000;¹ and these modest sums are not always spent within the schools. Statistics confirm the unfavorable prognosis: the ten schools which the sect possessed in 1901 have now dwindled to eight; a maximum enrolment of 1014 in 1904 has already shrunk to 418; graduates numbered 186 in 1906, 84 in 1909.

So far as sectarian creeds go, there is, of course, no reason why these schools should be elaborately equipped for scientific instruction. They talk of laboratories, not because they appreciate their place or significance, but because it pays them to defer thus far to the spirit of the times. Culpable indeed they are, however, for their utter failure to make good what their own tenets prescribe. The eclectics are drug mad; yet, with the exception of the Cincinnati and New York schools, none of them can do justice to its own creed. For they are not equipped to teach the drugs or the drug therapy which constitutes their sole reason for existence.²

The eight osteopathic schools³ fairly reek with commercialism. Their catalogues are a mass of hysterical exaggerations, alike of the earning and of the curative power of osteopathy. It is impossible to say upon which score the "science" most confidently appeals to the crude boys or disappointed men and women whom it successfully

¹ Estimated.

² The physio-medical sect can be dismissed in a note. It had three schools in 1907; only one, that in Chicago, is left. The reader will find it described in Part II, under Illinois, no. (11). There were 149 physio-medical students in 1904; there are now 52; there were 90 graduates in that year, 15 in 1909.

³ One school is found in each of the following cities: Chicago, Des Moines, Kirksville (Missouri), Kansas City (Missouri), Philadelphia, Cambridge (Massachusetts), and two at Los Angeles.

exploits. "In no case has a competent osteopath made a failure in his attempt to build up a paying practice. . . . His remuneration, counted in dollars, will be greatly in excess of what he could reasonably expect in most other lines of professional work."¹ "It is only fair to say that many of our graduates are earning as much in single months as they were formerly able to earn by a full year's work."² "The average osteopath has a better practice than ninety out of every hundred medical practitioners."³ "A lucrative practice is assured to every conscientious and capable practitioner."⁴ "The graduate who does not make as much as the total cost of his osteopathic education in his first year of practice is the exception."⁵ Standards these concerns have none; the catalogues touch that point very tenderly. At the parent school at Kirksville an applicant will be accepted "if he pass examinations in English, arithmetic, history, and geography;" but if he should fail to meet these lofty scholastic requirements, he may be admitted anyway. In Massachusetts—the most homogeneously educated state in the Union—the Cambridge school diplomatically posits that "a diploma may be accepted or an examination be required if deemed advisable by the directors,"—the word "is" being conspicuous by its absence; the Pacific College, "chancing it," finds that "most make good."

Whatever his notions on the subject of treatment, the osteopath needs to be trained to recognize disease and to differentiate one disease from another quite as carefully as any other medical practitioner. Our account of the sect proceeds wholly from this point of view. Whether they use drugs or do not use them, whether some use them while others do not, does not affect this fundamental question. Whatever they do, they must know the body, in health and disease, before they can possibly know whether there is an occasion for osteopathic intervention, and if so, at what point, to what extent, etc. All physicians, summoned to see the sick, are confronted with precisely the same crisis: a body out of order. No matter to what remedial procedure they incline,—medical, surgical, or manipulative,—they must first ascertain what is the trouble. There is only one way to do that. The osteopaths admit it, when they teach physiology, pathology, chemistry, microscopy. Let it be stated, therefore, with all possible emphasis that no one of the eight osteopathic schools is in position to give such training as osteopathy itself demands. The entire course is only three years. In so simple and fundamental a matter as anatomy—assuredly the corner-stone of a "science" that relies wholly on local manipulation—they are fatally defective. At Kirksville the accommodations are entirely unequal to the teaching of its huge student body. Hence the first year is devoted to text-book study of anatomy, part of the second year to dissection; at Kansas City they consider that the student dissects better if he has learned anatomy first: hence

¹ *Catalogue*, Pacific College of Osteopathy, 1909-10, p. 9.

² *Catalogue*, Los Angeles College of Osteopathy, 1909-10, p. 9.

³ *Catalogue*, Central College of Osteopathy, 1908-9, p. 22.

⁴ *Catalogue*, Philadelphia College of Osteopathy, 1909-10, p. 48.

⁵ *Catalogue*, Massachusetts College of Osteopathy, 1909-10, p. 10.

dissection comes in the latter half of the course, being completed just one-half year before graduation. The supply of material is also scant: the school had had one cadaver early in the fall and was looking ahead to a second the latter part of the winter. The Los Angeles college has a small room with five tables for a student body numbering 250; it solves the difficulty by giving separate squads two hours a week each. At Philadelphia the department of anatomy occupies an outhouse, whence the noisome odor of decaying cadavers permeates the premises. Other subjects fare even worse. A small chemical laboratory is occasionally seen,—at Philadelphia it happens to be in a dark cellar. At Kirksville a fair-sized room is devoted to pathology and bacteriology; the huge classes are divided into bands of 32, each of which gets a six weeks' course, following the directions of a rigid syllabus under a teacher who is himself a student. At Cambridge pathology comes in the last year. A professor in the Kansas City school said of his own institution that it had practically no laboratories at all; the Still College at Des Moines has, in place of laboratories, laboratory signs; the Littlejohn at Chicago, whose catalogue avers that the "physician should be imbued with a knowledge of the healing art in its widest fields, and here is the opportunity,"¹ has lately in rebuilding wrecked all its laboratories but that of chemistry without in the least interfering with its usual pedagogic routine.²

Nowhere is there the faintest effort to connect the "laboratory teaching" with "clinical osteopathy;" perhaps because no school has anything approaching the requisite clinical opportunities. Once more, their tenets are not in question. Much difference of opinion prevails among them as to whether they should teach everything or only some things; as to whether they may use drugs in certain conditions or must confine themselves wholly to manipulation for "osteopathic lesions." However this may be, the osteopath cannot learn his technique and when it is applicable, except through experience with ailing individuals. And these, for the most part, he begins to see only when his prosperity begins after receiving his "D.O." degree. The Kirksville school (560 students) has indeed a hospital of 54 beds, of which, however, only 20 are in the wards, and practically all are surgical. Eight obstetrical cases were obtained in April and May of last year. The Des Moines and Kansas City schools have no hospitals at all; the students see no acute cases "unless the doctors can take them along." The Pacific College has a hospital of from twelve to fifteen surgical and obstetrical beds, all pay; "the students have no regular work at the hospital as there are so few acute cases; they don't see as much acute work as they should, but they treat everything." The Littlejohn (Chicago) has also a pay hospital, of 20 beds, mostly surgical. The Philadelphia school, whose "opportunities for practical work" are highly extolled in its catalogue, has an infirmary with three beds, occupied by

¹ *Bulletin*, June 15, 1909, p. 7.

² This school teaches medicine as well as osteopathy. It offers instruction in materia medica and therapeutics, practice of medicine,—and yet it is a three-year school.

maternity cases if at all; the Cambridge student must travel an hour or more to the Chelsea Hospital, a pay institution of from ten to fifteen rooms.

The mercenary character of osteopathic instruction is nowhere more conspicuously displayed than in the dispensaries, designed in theory to turn a humanitarian impulse to educational account. The osteopathic schools insert a cash nexus: the patients almost always pay. At Kansas City students give treatment to patients who pay three dollars a month; those paying more are treated by the professors. At Kirksville two dollars a treatment is charged. The cases are mostly chronics, an instructor being present at the first treatment; afterwards, only if summoned. At Los Angeles the cheapest obtainable treatment is three dollars for "examination" and one month's treatment before the class; at Des Moines the "professor administers to high-priced patients, the students to others."

The eight osteopathic schools now enroll over 1800 students, who pay some \$200,000 annually in fees. The instruction furnished for this sum is inexpensive and worthless. Not a single full-time teacher is found in any of them. The fees find their way directly into the pockets of the school owners, or into school buildings and infirmaries that are equally their property. No effort is anywhere made to utilize prosperity as a means of defining an entrance standard or developing the "science."¹ Granting all that its champions claim, osteopathy is still in its incipiency. If sincere, its votaries would be engaged in critically building it up. They are doing nothing of the kind. Indeed, in none of the sectarian schools does one observe progressive effort even along the lines of its own creed. And very naturally: dogma is sufficient unto itself. It may not search its own assumptions; it does well to adopt from the outside, after forced restatement in its own terms.²

In dealing with the medical sectary, society can employ no special device. Certain profound characteristics in one way or another support the medical dissenter: now, the primitive belief in magic crops up in his credulous respect for an impotent drug; again, all other procedure having failed, what is there to lose by flinging one's self upon the mercy of chance? Instincts so profound cannot be abolished by statute. But the limits within which they can play may be so regulated as to forbid alike their commercial and their crudely ignorant exploitation. The law may require that all practitioners of the healing art comply with a rigidly enforced preliminary educational standard; that every school possess the requisite facilities; that every licensed physician demonstrate a practical knowledge of the body and its affections. To these terms no reasonable person can object; the good sense of society can enforce them upon reasonable and unreasonable alike. From medical sects that can live on these conditions, the public will suffer little more harm than it is destined to suffer anyhow from the necessary incompleteness of human knowledge and the necessary defects of human skill.

¹ At the Pacific College of Osteopathy alone were two workers doing some research.

² In this fashion homeopathy handles serum-therapy as a case of similars.

CHAPTER XI

THE STATE BOARDS

THE state boards are the instruments through which the reconstruction of medical education will be largely effected. To them the graduate in medicine applies for the license to practise. Their power can be both indirectly and directly exerted. They may after examination reject an applicant,—an indirect method of discrediting the school which has vouched for him by conferring its M.D. degree. A small percentage of failures the doctrine of chance would lead one to expect; an increasing proportion must cast increasingly serious doubt on any institution. A more direct and therefore more salutary method is needed, however, in dealing with schools bad beyond a reasonable doubt. In such instances the board should summarily refuse to entertain the applicant's petition because his medical education rests upon no proper preliminary training or was received under conditions that forbade thorough or conscientious instruction: the full weight of its refusal would fall with crushing effect upon the school which sent him forth. No institution can long survive the day upon which it is thus publicly branded as feeble, unfit, or disreputable. For the purpose, however, of saving the victims whose cruel disappointment will in time destroy these schools, the arm of the state boards should for the present go beyond the rejection of individuals to the actual closing up of notoriously incompetent institutions. The law that protects the public against the unfit doctor should in fairness protect the student against the unfit school.

With the manifold duties and responsibilities of the state boards we cannot here fully deal. Our attention is necessarily confined to their educational function. They examine candidates for license; but admission to examination should be granted only after a fair presumption of intellectual fitness in favor of the applicant has been established by the record of his preliminary education, and a fair presumption of sufficient professional training by his graduation from a recognized or reputable medical school. Neither of these points can for the present be overlooked. So long as the medical school has as such no determinate position in the school system, the public health authorities must be empowered to fix at least the lowest point to which it can safely be permitted to fall; moreover, so long as any group of physicians may in most states incorporate a medical school under general laws that offer no safeguard at all, and license examinations are not yet deliberately constructed to frustrate their activity, summary protective power against mercenary and incompetent faculties must be lodged somewhere. The boards therefore touch at three points the problems with which this report has dealt: for they deal (1) with the preliminary educational requirement, (2) with the facilities of medical schools, (3) with examinations for licensure.

In all these respects, the scope of the state board is of course determined by statute. Let us consider briefly what powers in respect to each are needed if the boards are

to be effective in the reconstruction to which we look forward.

(1) However the educational prerequisite be defined, the board must be authorized to insist upon it as an educational, and not as a practice, preliminary. The sole reason for a preliminary requirement of any kind is as a method of restricting the study of medicine to those in whose favor an initial presumption of fitness exists. An ordinary secondary school education may be taken as indicating minimum competency only if it chronologically precede admission to the medical school. As a matter of fact, some state boards legally empowered to enforce the high school basis are often strangely careless as to the significance of dates; so that a requirement whose sole value resides in its priority to medical education is held to be satisfied if fulfilled just prior to graduation or to licensure.

The evaluation of preliminary credentials is a task requiring expert knowledge and experience. Certain boards have striven hard to discharge this function effectively; but they lack an organization competent to deal with it. It may be that as the feasibility of federated action is increased by an approach to uniformity in laws and ideals, a central authority can be constituted by voluntary coöperation of the state boards, maintained by contributions from their several funds, and charged with the business of procuring first-hand information respecting secondary schools and colleges. Such an agency could, by communication with the proper educational organizations engaged in the study and improvement of secondary schools, command reliable data for the evaluation of credentials prior to matriculation. In default thereof, the board of each state, instead of endeavoring to act on such knowledge as it can obtain, should get at once into effective relations with the state university, or with some endowed institution accustomed to pass upon questions of this kind; and the medical schools should be compelled to have a student's application "viséd" by the state board before matriculation is regarded as complete. If neither time nor subject credit could be given by the medical school for any work prior to completed matriculation, an actual four-year high school preliminary requirement would be in force.¹

(2) The enforcement of even the four-year high school standard will so far clean up the medical field that the state boards will at once be relieved of the duty of dealing with actually disreputable schools. Until that has been accomplished, these boards should be empowered to refuse applications from the graduates of schools scandalously defective in teaching facilities. The power here in question, if extended too far, would involve serious dangers. For boards authorized to decide whether schools are satisfactory may be led to specify the details which determine their judgment. In some quarters they have already shown a tendency to prescribe minutely the contents of a proper medical education. Their motive has been excellent; they have tried to compel poor schools to give a good education. Unfortunately, that is quite impossible: teachers may sign a register showing due attendance upon their classes, just as students may scrupulously attend specified exercises in every essen-

¹The same process can be employed in the south to enforce whatever standard is there decided on.

tial branch for a fixed number of hours; but the instruction will probably be no whit improved by such police regulation. Meanwhile every competent and earnest instructor is seriously hampered by the vain effort to aid those who are beyond human help. The fact is that an enforced entrance requirement at one end and a proper examination at the other will of themselves limit the survival of schools to those that are financially and educationally competent. Only so long as an entrance requirement cannot be enforced or a proper examination arranged, do the state boards need the power to close schools obviously and notoriously defective.

(3) The examination¹ for licensure is indubitably the lever with which the entire field may be lifted; for the power to examine is the power to destroy. At present, these examinations are not only without stimulating effect; they are actually depressing. There is only one sort of licensing test that is significant, *viz.*, a test that ascertains the practical ability of the student confronting a concrete case to collect all relevant data and to suggest the positive procedure applicable to the conditions disclosed. A written examination may have some incidental value; it does not touch the heart of the matter. It tends, indeed, to do just the reverse. Written examinations are notably apt to follow beaten paths. A collection of state board examinations covering even a brief period of years will contain most of the questions that will be asked hereafter. An effective, but purely mechanical and entirely useless drill may be employed to make examination-proof a student who in the presence of a sick person would be quite helpless. As a matter of fact, prominent publishers put forth "State Board Questions" and "Quiz-compends" with "answers." These manuals, well conned, guarantee the candidate's safety. Do not the several states appear to do almost everything in their power to resist the production of a well trained body of physicians? In the first place, they permit a half-dozen men to start a medical school as lightly as they permit them to open a printing-shop; and they then offer them every inducement to furnish poor training by permitting the graduates to undergo an examination for which they can satisfactorily prepare by an inexpensive drill that has no bearing on the practical ends for which doctors are needed. A proper examination would go far to correct all the defects that this report has sought to point out. For low entrance standards, deficient equipment, bad teaching, lack of clinical material, failure to correlate laboratory and clinic, would be detected and punished by a searching practical examination.

If the written examination were relegated to a subordinate position, the weight of the test would fall upon the applicant's ability to do things; schools incapable for whatever reason of training students in the necessary technique would be rapidly exposed through the annual publication of statistics proclaiming their failure. The state board results, now so frequently misleading, would be a trustworthy index which the more intelligent students would carefully scan; and those schools only would sur-

¹ For an excellent discussion, see Councilman: "Methods and Objects of State Board Examinations," *Journal of American Medical Association*, Aug. 14, 1909, pp. 515-19.

vive whose records entitle them to live. Of such overwhelming importance, indeed, is the character of the license examination that, if thorough practical examinations were instituted, all the other perplexing details we have discussed would become relatively immaterial.

How far we now are from this ideal realized in other countries, hardly aspired to in America, a few facts make plain. In 1906, the worst of the Chicago schools—a school with no entrance requirement, no laboratory teaching, no hospital connections—made before state boards the best record attained by any Chicago school in that year. This school, essentially the same now as then, has only recently been declared “not in good standing” with the state board of Illinois. Everywhere in Canada and the United States wretched institutions refute criticism by pointing to their successful state board records. Halifax and Western University candidates pass in Canada side by side with students from McGill and Toronto, though not in an equal proportion; for even in the written examination, better opportunities tell in the long run. Good didactic teaching at Bowdoin or Dartmouth proves capable of satisfying examinations that should strongly stress clinical experience. One or two of the states have latterly begun to introduce certain practical features into their examinations. These timid beginnings are hopeful signs, as yet, however, hardly extensive enough anywhere materially to affect either the kind of teaching employed or the outcome of the examination. The army and navy have gone a little further towards developing a practical examination than has any state board; and their written tests are probably also more severe; with the result that between the years 1900 and 1909, 46 per cent of graduated doctors applying for the naval medical corps failed; between 1904 and 1909, 81 per cent of the applicants for the Marine Hospital service failed; and out of 1512 candidates for the army medical corps between 1888 and 1909, 72 per cent failed:¹ this, although very few of the applicants examined came from the unmitigatedly bad schools.

To do their duty fully, the state boards require to be properly constituted, organized, and equipped. At present none of them fulfils all these conditions. In consequence it is difficult to know where to lodge responsibility. In some states the law is so weak that a board can be successfully “mandamus’d” the moment it raises a finger. Elsewhere, a good law is practically negated by the inactivity, if not worse, of a board that excuses itself by the apathy of the public or by the “pull” of the medical schools. In general the boards have not been strongly constituted. In many states appointments are regarded as political spoils; quite generally teachers are ineligible for appointment. It happens, therefore, that the boards are sometimes weak, and either unwilling to antagonize the schools or legally incapable of so doing; again, well meaning but incompetent; in some cases unquestionably neither weak nor well

¹ For the records upon which these statements are based, acknowledgments are due to the Surgeon-General of the Navy, the Surgeon-General of the Marine Hospital Service, and to the Surgeon-General of the Army, respectively.

meaning, but cunning, powerful, and closely aligned with selfish and harmful political interests. In a few instances, that stand out, the boards are vigorous, intelligent, and public spirited,—notably in Colorado, Michigan, and Minnesota.

In the matter of organization they are decidedly defective. The whole weight rests usually upon a single executive officer, the secretary, whose sole staff consists of a stenographer, if that. As long as everything depends on the personality of a single individual, administration will be liable to marked fluctuations. There can be neither security nor continuity. For enlightened public opinion and accepted ideals have not as yet established definite and correct policy. Organization would within limits be independent of individuals; for it embodies a routine that fortifies every gain won, and makes possible the division of labor that is indispensable to system and thoroughness.

A bureau properly organized cannot live on small fees. It requires liberal support; for it must be in position to take trouble to secure information and to defend its rights. The power that validates the diploma with its license must have the strength to protect its issues against either debasement or infringement. The physician, like the lawyer, is an agent of the state. If he proves unworthy, the same board that vouched for him must have power to recall its act; and its function must extend to the prosecution of fraudulent or unwarranted attempts to practise without its official sanction. Any effort to exercise powers of recall or restraint will of course be resisted. The state must therefore provide funds that will enable the board to defend its action in the courts.

A model state board law must therefore guard the following points: the membership of the board must be drawn from the best elements of the profession, including—not, as now, prohibiting—those engaged in teaching; the board must be armed with the authority and machinery to institute practical examinations, to refuse recognition to unfit schools, and to insist upon such preliminary educational standards as the state's own educational system warrants; finally, it must be provided either by appropriation or by greatly increased fees with funds adequate to perform efficiently the functions for which it was created. The additional powers needed in order to deal as effectively with the practice of medicine, lie outside the present discussion.

Far-reaching legislative changes would be required in most states before the state boards could play the part here assigned to them. Yet for it they are clearly destined. As a matter of fact, recent legislation has been self-contradictory. The boards have been strengthened, their powers more satisfactorily defined; and thereupon the end thus sought has been partially defeated by the creation of sectarian boards with lower standards and looser ideas. Minnesota, for example, obtained an excellent law, consolidated the medical schools of the state, established a high standard, and quarantined against invasion by a low-grade product from without; and then, having fairly secured for the people of the state the best attainable conditions in the matter of protecting the public health, it proceeded partly to undo the good work by es-

tabliating a separate osteopathic board with power to license osteopaths — who will treat all diseases, and quite possibly in all sorts of ways — according to standards and methods fundamentally at variance with the main statute already outlined. The creation of separate boards is thus a roundabout method of recommitting the errors that the main currents of scientific thinking and effort are endeavoring to remedy. Our forty-nine states and territories have now eighty-two different boards of medical examiners. The province of the state in this matter is plain. It cannot allow one set of practitioners to exist on easier and lower terms than another. It cannot indeed be a party to scientific or sectarian controversy. But it can and must safeguard the conditions upon which such controversy may be fought to its finish. The mooted points concern only therapeutics; in respect to all else there is complete agreement. If matters in dispute are omitted from the examination, enough is left for all essential purposes. A single board should subject all candidates, of whatever school, to the same tests at every point. The license of the state is a guarantee of knowledge, education, and skill. The layman is in no position to make allowances. The state's M.D. and the state's D.O. offer themselves for essentially the same purposes. The state stands equally as guarantor of both. No citizen can indeed be wholly protected by the state against his own ignorance, fanaticism, or folly. A man who does not "believe" in doctors cannot be forced to call them in or to heed them, any more than a man who does not "believe" in wearing rubbers can be compelled to don them in slushy weather. The state is powerless there. But having undertaken to visé practising physicians for the protection of those who summon them, it must see to it that the licenses to which it gives currency bear a fairly uniform value. Between the graduate of Harvard and the graduate of the Boston College of Physicians and Surgeons, the layman could not judge even if he knew the origin of each; as a matter of fact, he rarely knows so much. But in the act of licensing both for one purpose, the state assures its citizens of their substantial equality. It is shocking to reflect that, what with written examinations and separate boards, the divergencies run all the way from a high degree of competency to utter ignorance and unfitness.

There is no question that in the end the medical sects will disappear. The dissenter cannot live on high entrance and educational standards. Pending his disappearance, the combination board is the least of the evils to which we are liable. The terms upon which these boards are now obtainable throw a strong light on the backward state of public opinion. In New York state, homeopaths, eclectics, and osteopaths, making together but a negligible proportion of the practising physicians of the state, have together a majority on the state examining board.

Under existing conditions, though the state boards might well be constituted on a uniform plan and with the same powers, a certain degree of diversity is unavoidable; but a certain degree of inevitable diversity is no excuse for hopeless confusion. The variations now found both in the laws and in their administration are fairly chaotic. In one state the board can and does fix entrance requirements; in the next

it can, but does not; in a third it neither does nor can. Six boards¹ have announced the requirement of one or more years of college work preliminary to medical schooling as the basis of practice in their respective states; but seventy-six remain to be converted. Their conversion, with the necessary changes in the state laws, must precede the actual elevation of the entire medical profession. For though agreed elevation of standard by individual schools improves their own product and indirectly leavens the mass, it does not stop the making of low-grade doctors. Temporarily it even assists the low-grade school. The ultimate improvement of the entire mass will come from control of all schools through the state boards, and not merely from voluntary action on the part of the more self-respecting institutions. The middle west seems likely—the osteopaths permitting—first to realize this condition; for the states will surely not leave the practice of medicine within their borders open to strangers on terms denied to their own sons.

Whether or not it will be left for the osteopaths to say, depends just now on making the public appreciate the fact that the point at issue is not a matter of business. A clever hue and cry has been raised to give the controversy the appearance of a competition between rival claimants for business patronage. The instinct for fair play, opposition to exclusive or aristocratic privileges, have thus won for the sectarian a chance on his own terms. Unfortunately, this leaves the sick man wholly out of account. Medicine, curative and preventive, has indeed no analogy with business. Like the army, the police, or the social worker, the medical profession is supported for a benign, not a selfish, for a protective, not an exploiting, purpose. The knell of the exploiting doctor has been sounded, just as the day of the freebooter and the soldier of fortune has passed away.

Despite imperfect and discordant laws and inadequate resources, the state board has abundantly justified itself. It is indeed hardly more than quarter of a century old; yet, in summing up the forces that have within that period made for improved conditions, the state boards must be prominently mentioned. Their rôle is likely to be increasingly important. They have developed considerable *esprit de corps*. Their power of combined action on broad lines has distinctly increased even in the last few years. Reciprocity between states whose laws are measurably concordant and whose ideals are taking similar shape tends to demonstrate the fundamental sameness of the problems requiring solution. Out of these first coöperative efforts, a model law will emerge; federated action may become possible. Perhaps the entire country may some day be covered by a national organization engaged in protecting the public health against the formidable combination made by ignorance, incompetency, commercialism, and disease.

¹ Minnesota, North Dakota, South Dakota, Connecticut, Colorado, Kansas.

CHAPTER XII

THE POSTGRADUATE SCHOOL

THE postgraduate school as developed in the United States may be characterized as a "compensatory adjustment." It is an effort to mend a machine that was predestined to break down. Inevitably, the more conscientious and intelligent men trained in most of the medical schools herein described must become aware of their unfitness for the responsibilities of medical practice; the postgraduate school was established to do what the medical school had failed to accomplish.

"When I graduated in the spring of 1869," says Dr. John A. Wyeth,¹ "I can never forget the sinking feeling that came over me when I realized how incompetent I was to undertake the care of those in the distress of sickness or accident. A week later, after arriving in my native village in Alabama, I rented a small office and attached my sign to the front door. Within two months, the tacks were withdrawn by the hand which had placed them there and the sign was stowed away in the bottom of my trunk. Two months of hopeless struggle with a Presbyterian conscience had convinced me that I was not fit to practise medicine, and that nothing was left for me but to go out into the world of business to earn money enough to complete my education. I felt the absolute need of clinical experience, and a conviction, which then forced itself upon my mind, that no graduate in medicine was competent to practise until he had had, in addition to his theoretical, a clinical and laboratory training, was the controlling idea in my mind when, in later years the opportunity offered, it fell to my good fortune to establish in this city the New York Polyclinic Medical School and Hospital."

The postgraduate school was thus originally an undergraduate repair shop. Its instruction was necessarily at once elementary and practical. There was no time to go back to fundamentals; it was too late to raise the question of preliminary educational competency. Urgency required that in the shortest possible time the young physician already involved in responsibility should acquire the practical technique which the medical school had failed to impart. The courses were made short, frequently covering less than a month; and they aimed preëminently to teach the young doctor what to "do" in the various emergencies of general practice.

As the general level of medical education has risen, the function of these institutions has been somewhat modified. The general course, aiming to make good deficiencies at large, has tended to give way to special courses adapted to the needs of those inclined to devote themselves more or less exclusively to some particular line of work. Simultaneously, as the facilities of the schools have enlarged, they have become centers to which at intervals men practising in isolated places may return for

¹ *Proceedings of the Nineteenth Annual Meeting of the Association of American Medical Colleges*, pp. 25, 26 (abridged).

brief periods in order to catch up with the times. Once more the training offered is of a practical, not of a fundamental or intensive, kind. It is calculated to "teach the trick"—or, perhaps better, to exhibit an instructor in the act of doing it. For, as nothing is known of individuals in the stream of students who course through the schools, it is impossible to give them an active share in the work that goes on at the bedside or in the operating-room. Their part is mainly passive; they look on at expert diagnosticians or operators. The danger of permitting an unknown student, tarrying for a brief stay, to participate at close range is prohibitive. In surgery the so-called practical courses are not usually worked out in such fashion that cadaver work, animal work, and service as dresser might prepare for actual participation: the school lacks means and facilities; the students lack the time. In medicine the absence of sufficient material, the lack of proper hospital organization and equipment, the scrappiness of professional service, combine to prevent a systematic, thorough, and intimate discipline.

Of the thirteen postgraduate schools,¹ the best of them reflect the conditions and purposes above described. The Postgraduate and Polyclinic of New York and the Polyclinic of Philadelphia command large dispensary services and considerable hospital clinics, partly in their own hospitals, partly in public and private hospitals in the city. No unkind criticism is intended when the teaching is characterized as too immediately practical to be scientifically stimulating: it has the air of handicraft, rather than science. Comparatively little is done in internal medicine: surgery and the specialties predominate. The courses, being practical and definite, are disconnected; the faculties are huge and unorganized. In the main, demonstrative instruction is offered to small bodies of physicians, who come and go uninterruptedly through the year. Only one of the three—the Philadelphia school—has a laboratory building, and in that no advanced work is in progress; the two New York schools have laboratory space or equipment adequate only to routine clinical examinations. The teaching is in the main more elementary than the upper class instruction of a good undergraduate school of medicine. It is, of course, also at times more special in character. With the exception of the New York Postgraduate, these schools are without endowment: they live on fees, donations, and hospital receipts.

Two departmental postgraduate schools are conducted by the government at Washington for those accepted for service in the army or navy medical corps. Eligible for these appointments are graduated physicians who have had a year of hospital experience or three years of practice. Excellent practical instruction is furnished by way of supplementing the usual undergraduate course. The needs of the services can

¹ Four are situated in Greater New York: (1) The New York Polyclinic Medical School, (2) New York Postgraduate Medical School, (3) Brooklyn Postgraduate Medical School, (4) Manhattan Eye, Ear, and Throat Postgraduate School; four in Chicago: (5) Postgraduate Medical School, (6) The Chicago Polyclinic, (7) Illinois Postgraduate Medical School, (8) Chicago Ear, Eye, Nose, and Throat College; one each in Philadelphia, (9) The Philadelphia Polyclinic; Kansas City, (10) Postgraduate Medical School; New Orleans, (11) New Orleans Polyclinic (affiliated with Tulane University); and two in Washington, (12) Army Medical School, (13) Navy Medical School. A number of schools offer special courses to graduates, in special summer and regular winter sessions.

be very definitely formulated; the course worked out aims to meet them. The accepted surgeons get in this way a concentrated practical drill in bacteriology, hygiene, and military surgery. The laboratories are excellently equipped, though cramped for space. The army school enjoys the advantage of contact with the great library and museum of the surgeon-general's office. The schools, as yet in their infancy, may not improbably develop into research laboratories dealing with the specific problems that crop up in naval and military service in various quarters of the globe.

Postgraduate, like other schools, vary in character. We have spoken of the best. The others are weak concerns wearing a commercial hue. The Brooklyn Postgraduate School, for instance, entertains less than half a dozen students on the average at a time, in a wretched hospital, really a death-trap, heavily laden with debt, and without laboratory equipment enough to make an ordinary clinical examination; the Kansas City affair had, when visited, no students in its improvised hospital containing 25 ward beds, only 13 of them occupied; it ekes out its opportunities with clinics at the public hospital. Chicago, varied and picturesque in this as in all else pertaining to medical education, supports four postgraduate institutions. None of them has a satisfactory plant. All are stock companies. Only unmistakable scientific activity could dislodge the unpleasant suspicion of commercial motive thus suggested. No such activity is in any of them observable. A cynical candor admits in one place that "it pays the teachers through referred cases;" in another, "it establishes the reputation of a man to teach in a postgraduate school;" in a third, "it pays through advertising teachers." In one a youth was observed working with a microscope. Inquiry elicited the fact that he was the teacher of clinical laboratory technique, lecturing in the absence of the "professor." The following dialogue took place:

"Are you a doctor?"

"No."

"A student of medicine?"

"Yes."

"Where?"

"At the Jenner Night School."

"In what year?"

"The first."

A first-year student of medicine in a night school was thus laboratory instructor and *pro tempore* lecturing professor in clinical microscopy in the Chicago Polyclinic.

Improved medical education will undoubtedly cut the ground from under the independent postgraduate school as we know it. This is not to say that the undergraduate medical curriculum will exhaust the field. On the contrary, the undergraduate school will do only the elementary work; but that it will do, not needing subsequent and more elementary instruction to patch it up. Graduate instruction will be advanced and intensive,—the natural prolongation of the elective courses now coming into vogue. For productive investigation and intensive instruction, the medical school will

use its own teaching hospital and laboratories; for the elaboration of really thorough training in specialties resting on a solid undergraduate education, it may use the great municipal hospitals of the larger cities. But advanced instruction along these lines will not thrive in isolation. It will be but the upper story of a university department of medicine. The postgraduate schools of the better type can hasten this evolution by incorporating themselves in accessible universities, taking up university ideals, and submitting to reorganization on university lines.

CHAPTER XIII

THE MEDICAL EDUCATION OF WOMEN

MEDICAL education is now, in the United States and Canada, open to women upon practically the same terms as men. If all institutions do not receive women, so many do, that no woman desiring an education in medicine is under any disability in finding a school to which she may gain admittance. Her choice is free and varied. She will find schools of every grade accessible: the Johns Hopkins, if she has an academic degree; Cornell, if she has three-fourths of one; Rush and the state universities, if she prefers the combined six years' course; Toronto on the basis of a high school education; Meridian, Mississippi, if she has had no definable education at all.

Woman has so apparent a function in certain medical specialties and seemingly so assured a place in general medicine under some obvious limitations that the struggle for wider educational opportunities for the sex was predestined to an early success in medicine. It is singular to observe the use to which the victory has been put. The following tables show recent developments in coeducational and in women's medical schools taken separately:

<i>Year</i>	<i>Number of Coeducational Medical Schools</i>	<i>Number of Women Students</i>	<i>Number of Women Graduates</i>
1904	97	946	198
1905	96	852	165
1906	90	706	200
1907	86	718	172
1908	88	649	139
1909	91	752	129

<i>Year</i>	<i>Women's Medical Schools</i>	<i>Number of Students</i>	<i>Number of Graduates</i>
1904	3	183	56
1905	3	221	54
1906	3	189	33
1907	3	210	39
1908	3	186	46
1909	3	169	33

COMBINED			
<i>Year</i>	<i>Number of Schools</i>	<i>Number of Women Students</i>	<i>Number of Women Graduates</i>
1904	100	1129	254
1905	99	1073	219
1906	93	895	233
1907	89	928	211
1908	91	835	185
1909	94	921	162

Now that women are freely admitted to the medical profession, it is clear that they show a decreasing inclination to enter it. More schools in all sections are open to them; fewer attend and fewer graduate. True enough, medical schools generally have shrunk; but as the opportunities of women have increased, not decreased, and within a period during which entrance requirements have, so far as they are con-

cerned, not materially altered, their enrolment should have augmented, if there is any strong demand for women physicians or any strong ungratified desire on the part of women to enter the profession. One or the other of these conditions is lacking,—perhaps both.

Whether it is either wise or necessary to endow separate medical schools for women is a problem on which the figures used throw light. In the first place, eighty per cent of women who have in the last six years studied medicine have attended coeducational institutions. None of the three women's medical colleges now existing can be sufficiently strengthened without an enormous outlay. The motives which elsewhere recommend separation of the sexes would appear to be without force, all possible allowance being made for the special and somewhat trying conditions involved. In the general need of more liberal support for medical schools, it would appear that large sums, as far as specially available for the medical education of women, would accomplish most if used to develop coeducational institutions, in which their benefits would be shared by men without loss to women students; but, it must be added, if separate medical schools and hospitals are not to be developed for women, interne privileges must be granted to women graduates on the same terms as to men.

CHAPTER XIV

THE MEDICAL EDUCATION OF THE NEGRO

THE medical care of the negro race will never be wholly left to negro physicians. Nevertheless, if the negro can be brought to feel a sharp responsibility for the physical integrity of his people, the outlook for their mental and moral improvement will be distinctly brightened. The practice of the negro doctor will be limited to his own race, which in its turn will be cared for better by good negro physicians than by poor white ones. But the physical well-being of the negro is not only of moment to the negro himself. Ten million of them live in close contact with sixty million whites. Not only does the negro himself suffer from hookworm and tuberculosis; he communicates them to his white neighbors, precisely as the ignorant and unfortunate white contaminates him. Self-protection not less than humanity offers weighty counsel in this matter; self-interest seconds philanthropy. The negro must be educated not only for his sake, but for ours. He is, as far as human eye can see, a permanent factor in the nation. He has his rights and due and value as an individual; but he has, besides, the tremendous importance that belongs to a potential source of infection and contagion.

The pioneer work in educating the race to know and to practise fundamental hygienic principles must be done largely by the negro doctor and the negro nurse. It is important that they both be sensibly and effectively trained at the level at which their services are now important. The negro is perhaps more easily "taken in" than the white; and as his means of extricating himself from a blunder are limited, it is all the more cruel to abuse his ignorance through any sort of pretense. A well-taught negro sanitarian will be immensely useful; an essentially untrained negro wearing an M.D. degree is dangerous.

Make-believe in the matter of negro medical schools is therefore intolerable. Even good intention helps but little to change their aspect. The negro needs good schools rather than many schools,—schools to which the more promising of the race can be sent to receive a substantial education in which hygiene rather than surgery, for example, is strongly accentuated. If at the same time these men can be imbued with the missionary spirit so that they will look upon the diploma as a commission to serve their people humbly and devotedly, they may play an important part in the sanitation and civilization of the whole nation. Their duty calls them away from large cities to the village and the plantation, upon which light has hardly as yet begun to break.

Of the seven medical schools for negroes in the United States,¹ five are at this moment in no position to make any contribution of value to the solution of the problem

¹Washington, D.C.: Howard University; New Orleans: Flint Medical College; Raleigh (N.C.): Leonard Medical School; Knoxville: Knoxville Medical College; Memphis: Medical Department of the University of West Tennessee; Nashville: Meharry Medical College; Louisville: National Medical College.

above pointed out; Flint at New Orleans, Leonard at Raleigh, the Knoxville, Memphis, and Louisville schools are ineffectual. They are wasting small sums annually and sending out undisciplined men, whose lack of real training is covered up by the imposing M.D. degree.

Meharry at Nashville and Howard at Washington are worth developing, and until considerably increased benefactions are available, effort will wisely concentrate upon them. The future of Howard is assured; indeed, the new Freedman's Hospital is an asset the like of which is in this country extremely rare. It is greatly to be hoped that the government may display a liberal and progressive spirit in adapting the administration of this institution to the requirements of medical education.

Meharry is the creation of one man, Dr. George W. Hubbard, who, sent to the south at the close of the war on an errand of mercy, has for a half-century devoted himself singly to the elevation of the negro. The slender resources at his command have been carefully husbanded; his pupils have in their turn remembered their obligations to him and to their school. The income of the institution has been utilized to build it up. The school laboratories are highly creditable to the energy and intelligence of Dr. Hubbard and his assistants. The urgent need is for improved clinical facilities—a hospital building and a well equipped dispensary. Efforts now making to acquire them deserve liberal support.

The upbuilding of Howard and Meharry will profit the nation much more than the inadequate maintenance of a larger number of schools. They are, of course, unequal to the need and the opportunity; but nothing will be gained by way of satisfying the need or of rising to the opportunity through the survival of feeble, ill equipped institutions, quite regardless of the spirit which animates the promoters. The subventions of religious and philanthropic societies and of individuals can be made effective only if concentrated. They must become immensely greater before they can be safely dispersed.

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PART II
MEDICAL SCHOOLS OF THE UNITED STATES
AND CANADA
ARRANGED ALPHABETICALLY BY STATES AND PROVINCES
AND SEPARATELY CHARACTERIZED

NOTE: *Facts given are as of date when the school was visited, which is specified in each case.*

The estimates of population have, with the few exceptions noted, been kindly made by the Director of the Census, through the courtesy of the Secretary of Commerce and Labor.

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MEDICAL SCHOOLS
OF THE UNITED STATES AND CANADA
ALPHABETICALLY ARRANGED BY STATES AND PROVINCES

ALABAMA

Population, 2,112,465. Number of physicians, 2287. Ratio, 1: 924.

Number of medical schools, 2.

BIRMINGHAM: *Population, 55,945.*

BIRMINGHAM MEDICAL COLLEGE. Organized 1894. A stock company, paying annual dividends of 6 per cent.

Entrance requirement: Nominal.

Attendance: 185, of whom 168 are from Alabama.

Teaching staff: 32, 18 being professors, none of them whole-time teachers.

Resources available for maintenance: Fees, amounting to \$14,550 (estimated).

Laboratory facilities: The teaching of anatomy, for which there is abundant material, is limited to dissecting on old-fashioned lines; there is the usual chemical laboratory and a small outfit for instruction in bacteriology and pathology; the material used for the latter is purchased in the east, not obtained from autopsies or clinics. No animals are provided for experimental purpose beyond the use of dogs for surgical work. There are no physiological, pharmacological, or clinical laboratories. The building is poorly kept, and there is neither library nor museum.

Clinical facilities: The school adjoins the Hillman Hospital, 98 beds, of which the faculty has charge during term time. Bedside clinics are held, but the students make no blood or urine examinations; obstetrical cases are rare; the hospital is largely given over to surgical patients,—gunshot and other wounds being decidedly abundant.

The dispensary service is as yet unorganized.

Date of visit: January, 1909.

MOBILE: *Population, 56,385.*

MEDICAL DEPARTMENT OF THE UNIVERSITY OF ALABAMA. Established 1859. Now an organic department of the state university, with which, however, its connection is legal only. The two institutions are at opposite ends of the state, so that the medical department is practically a local school.

Entrance requirement: Less than three-year high school education.

Attendance: 204.

Teaching staff: 25, of whom 8 are professors. No one devotes full time to medical instruction.

Resources available for maintenance: The school receives from the state an annual appropriation of \$5000, in return for which, however, sixty-seven free scholarships are given, one to each county; the school is therefore in effect wholly dependent on tuition fees, amounting to \$17,300, for its support, most of which is paid out in salaries.

Laboratory facilities: The laboratory equipment is practically limited to inorganic chemistry, elementary bacteriology and pathology, and anatomy, taught by dissecting first the goat, then the human cadaver. The school occupies a well kept old-fashioned building, recently remodeled. It possesses a few old books, but no funds with which to add to them; and a small museum, mostly composed of antiquated wax or papier-maché models.

Clinical facilities: For clinical instruction the school has access to the Sisters' Hospital, 100 beds, the faculty being the staff in term time. The senior students make blood and urine examinations in connection with clinical cases.

Connected with the college building is a new, well arranged dispensary, for the conduct of which an appropriation of \$50 a month is available.

Date of visit: January, 1909.

General Considerations

THE foregoing account makes it clear that really satisfactory medical education is not now to be had in Alabama. The entrance standards are low; the schools are inadequately equipped; and they are without proper financial resources. To get together their present numbers, standards must be kept low; in consequence, the medical schools do nothing to promote or to share the secondary school development of the state. To that and to any higher movement they are likely to be obstacles. Neither Alabama nor the rest of the south actually needs either school at this time; but as the state has become a patron of medical education, it will hardly retire from the field. Under these circumstances, its policy should aim to bring about a genuine and effective connection between the medical department and the rest of the state university. The task of elevating entrance standards in the medical department and of furnishing a higher quality of scientific training would probably be assisted for the time being by removing the instruction in the first and second years to the university itself at Tuscaloosa; for in no other way can whole-time instructors be now procured. An improvement in the quality of training furnished in the scientific branches will ultimately compel a higher quality of clinical instruction. It is difficult to see how the influence or control of the university can in any event be made effective in Mobile, 232 miles distant, at the opposite end of the state, and in a hospital in whose clinical

management there is no continuity. Birmingham is much closer, being only 56 miles distant, and promises to offer a larger supply of clinical material. If, therefore, the state is able to look at the question on its own merits, without regard to the rival claims of competing towns, it should establish a practice requirement that would automatically suppress proprietary instruction. For the present, the university might offer two years' work at Tuscaloosa, reserving to a more propitious time the entire question of organizing under effective university control a complete medical school at Birmingham, which is the nearest feasible location. As the state now contains one physician to every 924 inhabitants, the restriction or suspension of clinical teaching for some years to come involves no danger to the community.

ARKANSAS

Population, 1,476,582. Number of physicians, 2535. Ratio, 1: 582.
Number of medical schools, 2.

LITTLE ROCK: *Population, 44,931.*

(1) **MEDICAL DEPARTMENT, UNIVERSITY OF ARKANSAS.** Organized 1879. An independent institution, not even "affiliated" with the state university whose name it bears.

Entrance requirement: Nominal.

Attendance: 179, 81 per cent from Arkansas.

Teaching staff: 35, 18 being professors.

Resources available for maintenance: Fees, amounting to \$14,100 (estimated).

Laboratory facilities: After an existence of thirty years without any laboratory facilities except a dissecting-room and a laboratory for inorganic chemistry, a frame building has recently been supplied with a meager equipment for the teaching of pathology and bacteriology. The session was, however, already well started and the new laboratory not yet in operation. No museum, no books, charts, models, etc., are provided.

Clinical facilities: Hardly more than nominal. The school adjoins the City Hospital, with a capacity of 30 beds. From this hospital patients are brought into the amphitheater of the school building. There are no ward visits. The students see no contagious diseases; obstetrical work is precarious; of post-mortems there is no mention.

There is a small dispensary, of whose attendance no record is procurable.

Date of visit: November, 1909.

(2) **COLLEGE OF PHYSICIANS AND SURGEONS.** Organized 1906. An independent organization, formed by men not in the older school.

Entrance requirement: Nominal.

Attendance: 81, 59 per cent from Arkansas.

Teaching staff: 34, 25 being professors.

Resources available for maintenance: Fees, amounting to \$6450 (estimated).

Laboratory facilities: Separate, recently organized, and very disorderly laboratories for pathology, bacteriology, and chemistry, which with pharmacy work are all in charge of a single teacher, who is also pathologist to the County Hospital, three miles off. He proposes shortly to add physiology. The usual wretched dissecting-room is also provided. None of the necessary illustrative paraphernalia are at hand in the shape of books, charts, museum, etc.

Clinical facilities: The faculty of the school controls an adjoining hospital, from which patients are brought into the amphitheater for demonstration or operation. At operations it is claimed that students assist. No ward rounds are made. Occasional clinics are also held at two distant hospitals (county and penitentiary). Obstetrical and acute medical cases are rare; contagious diseases are not seen. There are no post-mortems. A small daily dispensary attendance is claimed. There is no adequate dispensary equipment.

Date of visit: November, 1909.

General Considerations

BOTH the Arkansas schools are local institutions in a state that has at this date three times as many doctors as it needs; neither has a single redeeming feature. It is incredible that the state university should permit its name to shelter one of them. The general educational interests of the state require that the state university, now inconveniently located at Fayetteville, should be moved to Little Rock. Once there, it could probably get possession of both schools and organize something better than either, which it could improve as its resources increase with the general prosperity of the state.

CALIFORNIA¹

Population, 1,729,543. Number of physicians (exclusive of osteopaths), 4813. Ratio, 1: 401.

Number of medical schools, 10.

LOS ANGELES: *Population*, 116,420.

(1) COLLEGE OF PHYSICIANS AND SURGEONS. Established 1903 as an independent

¹The Director of the Census states: "The cities of Los Angeles, Oakland, Berkeley, and San Francisco have had such an exceptionally rapid increase that no estimates of their population have been prepared." The figures given are taken from the census of 1900.

school, it suddenly became, in 1909, nominally the medical department of the University of Southern California, when the former medical department of that institution cut loose in order to become the Los Angeles clinical department of the University of California. The seriousness with which the University of Southern California treats medical education may be gathered from this amusing performance.

Entrance requirement: High school graduation or "equivalent."

Attendance: 82.

Teaching staff: 41, 28 being professors. The teachers are practising physicians; no one gives his entire time to the school.

Resources available for maintenance: Fees, amounting to \$4075 (estimated).

Laboratory facilities: The school is ordinary in type. It possesses a small chemical laboratory, a single laboratory in common for pathology, histology, and bacteriology, with meager equipment and supplies, and no animals; a dissecting-room with sufficient anatomical material, and clay for modeling bones; a limited number of wet specimens, and a small number of books in a room that is locked, though opened to students on request. There is no laboratory for physiology or pharmacology. The building is new, attractive, and fairly well kept.

Clinical facilities: A considerable part of one floor is used for a dispensary. The rooms are poorly equipped and cared for; there is no clinical laboratory. The attendance is very small, for the neighborhood is decidedly well-to-do.

The school adjoins a private hospital in which many of the teachers are interested. It is, however, of no teaching use. The catalogue describes it as "not a charity hospital by any means. . . . In fact it is a twentieth century classy hospital." For clinical instruction the students have access to the County Hospital, several miles distant, where the school has the use of 100 beds, holding clinics for senior students two days weekly. In surgery, students witness an operation without taking part in it; in medicine, the students make brief histories, which are, however, no part of the hospital records. Autopsies are done by the internes, who have no connection with the medical school. Students are not admitted to the obstetrical ward. Clinical facilities are thus extremely limited, for the management of the hospital is in no essential respect controlled by educational considerations.

Date of visit: May, 1909.

(2) UNIVERSITY OF CALIFORNIA: CLINICAL DEPARTMENT. Up to March, 1909, this school offered a four-year course as the medical department of the University of Southern California; it has now become a second clinical department of the University of California, and will therefore offer after June, 1910, only the third and fourth years' work. See (6).

Clinical facilities: Its present facilities for offering the instruction of the last two years are, for a university department on a two-year college basis, distinctly meager. It enjoys at the County Hospital the same facilities as the local College of Physicians and Surgeons, i.e., access to 100 beds, two or three days weekly being devoted to clinics for the senior class. Additional opportunities, depending on the personal connections of members of the faculty, are usually of slight pedagogic value. The school has an excellent dispensary building, fairly equipped in certain respects, but indifferently conducted, though the attendance is good. It is also in close proximity to a good medical library. The clinical teachers are all local practitioners. The state university will incur no expense on account of this department for two years at least.

Date of visit: May, 1909.

(3) CALIFORNIA MEDICAL COLLEGE. Eclectic. Organized at Oakland in 1879, this school has led a roving and precarious existence in the meanwhile.

Entrance requirement: Nominal.

Attendance: 9, of whom 7 are from California.

Teaching staff: 27, of whom 26 are professors.

Resources available for maintenance: Fees, amounting to \$1060 (estimated).

Laboratory facilities: The school occupies a few neglected rooms on the second floor of a fifty-foot frame building. Its so-called equipment is dirty and disorderly beyond description. Its outfit in anatomy consists of a small box of bones and the dried-up filthy fragments of a single cadaver. A few bottles of reagents constitute the chemical laboratory. A cold and rusty incubator, a single microscope, and a few unlabeled wet specimens, etc., form the so-called "equipment" for pathology and bacteriology.

Clinical facilities: There is no dispensary and no access to the County Hospital.

The school is a disgrace to the state whose laws permit its existence.

Date of visit: May, 1909.

(4) LOS ANGELES COLLEGE OF OSTEOPATHY. Emigrated from Iowa in 1905. A stock company.

Entrance requirement: Less than an ordinary grammar school education, with conditions. Many of the students are men and women of advanced years.

Attendance: Began two years ago with 60, now claims "more than 250."

Teaching staff: 19. All the teachers are practitioners.

Resources available for maintenance: Fees, the annual income being about \$37,500

from tuitions and a considerable sum from "treatments" (*see below*). As the instruction provided is inexpensive, the stock must be a very profitable investment.

Laboratory facilities: The school occupies a five-story building containing a chemical laboratory, with meager equipment and limited desk space, and a single laboratory for histology, pathology, and bacteriology. The dissecting-room contains five tables, but sufficient material. The rest of the building is mainly devoted to treatment rooms and the business office.

Clinical facilities: There is no free dispensary. Patients who are willing to undergo treatment before a class pay not less than \$3 a month; patients who are treated in the presence of a single student pay \$5. A hospital is now under construction.

The general aspect is that of a thriving business. An abundance of advertising matter, in which the profits of osteopathy are prominently set forth,¹ is distributed.

Date of visit: May, 1909.

(5) PACIFIC COLLEGE OF OSTEOPATHY. A stock company, established in 1896.

Entrance requirement: Ostensibly high school graduation; but "mature men and women who have been in business are given a chance and usually make good."

Attendance: 85.

Teaching staff: 38, 19 being professors.

Resources available for maintenance: Fees, amounting to \$12,750 (estimated).

Laboratory facilities: The school has an ordinary chemical laboratory, a fairly equipped laboratory for pathology, histology, and bacteriology, with a private laboratory for the instructor in these branches adjoining, the usual dissecting-room, and a limited amount of apparatus for experimental work in physiology.

Clinical facilities: A dispensary is carried on at the school, which also owns a hospital for obstetrical and surgical cases. The catalogue fails, however, to state that the students have no regular work in this hospital. They rarely see medical cases; "they don't have as much acute work as they should." Nevertheless, they are drilled to "treat gonorrhea by diet and antiseptics; syphilis with ointments and dietetics, and without mercury; typhoid, pneumonia, etc.," along the same lines.

Date of visit: May, 1909.

OAKLAND: Population, 73,812.

(6) COLLEGE OF MEDICINE AND SURGERY. Established 1902 as a stock company, stock partly subscribed by merchants of the town.

¹ "People are ready to pay for relief from distress and sickness. It is only fair to say that many of our graduates are earning as much in single months as they were formerly able to earn by a full year's work." (*Catalogue*, p. 9.)

Entrance requirement: "High school or equivalent."

Attendance: 17.

Teaching staff: 32, 13 being professors. There are no full-time teachers.

Resources available for maintenance: The school lives on fees, amounting to \$2760 (estimated), and on contributions from the faculty.

Laboratory facilities: It occupies a new, well kept building, has a small laboratory for experimental physiology, small separate laboratories for bacteriology, histology, and pathology, a beautiful, though not extensive, collection of pathological specimens, a laboratory for chemistry, a dissecting-room with provision for modeling, and a small library of slight value. Though there are no full-time teachers, there is evidence of active interest in pathology. Post-mortems are abundant and are intelligently used, through a fortunate connection of the instructor in pathology.

Clinical facilities: In respect to both dispensary and hospital, the clinical facilities are decidedly inadequate.

Date of visit: May, 1909.

SAN FRANCISCO: *Population*, 355,919.

(7) UNIVERSITY OF CALIFORNIA MEDICAL DEPARTMENT. Established as such 1872. An organic department of the university. The first and second years' work is given at Berkeley. *See* (2).

Entrance requirement: Two years of college work, strictly enforced.

Attendance: 36, all but 2 from California.

Teaching staff: 60, of whom 12 are professors. The laboratory courses at Berkeley are given by full-time teachers.

Resources available for maintenance: The department shares the university funds, its budget calling for \$33,396. The total receipts from fees are \$7004.

Laboratory facilities: The equipment and instruction are of the highest quality. The laboratories, though temporary in structure, are completely fitted up, in charge of high-grade teachers, abundantly provided with assistants and helpers. The sole question to be raised concerns the medical atmosphere, which, in several departments, is not strongly in evidence. In consequence, post-mortem work has not been hitherto cultivated, though abundant opportunities for it exist. The biological point of view prevails. This is not the case with anatomy, the teaching of which—thoroughly scientific in method and spirit—frankly meets the main purpose of the students.

Clinical facilities: Clinical instruction is given in San Francisco. The university hospital, its main reliance, is small but modern. It contains 75 beds, practically all

available for instruction.¹ Bedside teaching is carried on; but post-mortem work for the benefit of the students is meager. Some additional clinical work is procured at hospitals maintained by the city and by the United States government. In general, the laboratory and clinical departments are not as yet effectively correlated. The teachers of the third and fourth years are, excepting the dean, practitioners who are not in touch with the laboratory work and ideals as realized at Berkeley. Efforts are, however, making to bridge the gap.

The hospital is unfortunately situated from the standpoint of a dispensary; such material as there is, is not well used from a teaching point of view. The students do not in all departments take an active part in the dispensary work. For example, in some of them they have nothing to do with making up the records, which are separately kept in the several departments. No report, showing the number of the distribution of cases, is obtainable.

Date of visit: May, 1909.

(8) **LELAND STANFORD JUNIOR UNIVERSITY SCHOOL OF MEDICINE, ON THE COOPER MEDICAL COLLEGE FOUNDATION.** Until 1908, the Cooper Medical College offered a four-year course based on high school graduation. Its property has now been deeded to Stanford University, its buildings being the seat of the clinical department of Stanford University School of Medicine, the instruction of the last five semesters being given in Cooper Hall and Lane Hospital. That of the first three semesters is given at Palo Alto. As its present classes graduate, the Cooper Medical College passes out of existence and its faculty disbands.

Entrance requirement: Three years of college work.

Attendance: 16 in first year (fourth collegiate year). No other year's work has yet been given.

Teaching staff: 21, of whom 16 are professors. Six professors and one assistant professor give their entire time to medical work. The clinical professors thus far chosen have been taken from the former faculty of the Cooper Medical College.

Resources available for maintenance: The department will share in the general income of the university. A special library endowment amounts to about \$250,000.

Laboratory facilities: These are provided at Palo Alto on the same scale as other departments there (anatomy, pharmacology, bacteriology, physiology, physiological chemistry). The school has an unusually valuable library of some 85,000 volumes and receives the main current medical periodicals, American and foreign.

Clinical facilities: Clinical work on the part of Stanford University is not yet begun. The university now owns the Lane Hospital of 125 beds, which has hitherto been conducted as a pay institution. Patients paying \$10 a week are used for clinical

¹ During four months of 1909, there was a daily average of 44 free patients.

teaching; seventy-odd beds are thus available, part of these being temporarily supported by the city.¹ The hospital is now under temporary control of Cooper Medical College until needed by the university. Its organization at present, from the teaching point of view, is seriously defective. Records are meager; no surgical rounds are made in the wards; obstetrical work exists only in the form of an out-patient department; post-mortems are scarce. No hospital report is obtainable. The catalogue statement that the hospital is a teaching hospital is hardly sustained by the facts.

The dispensary in the college building adjoining had in 1907 an attendance of 20,000, including both old and new cases. But the material, though adequate in amount, was not thoroughly used by the Cooper Medical College.

Date of visit: May, 1909.

(9) COLLEGE OF PHYSICIANS AND SURGEONS. Established 1896. An independent school.

Entrance requirement: "High school education or equivalent."

Attendance: 70.

Teaching staff: 53, 23 being professors. There are no full-time teachers.

Resources available for maintenance: The institution has no resources but fees, amounting to \$7715 (estimated).

Laboratory facilities: The school has no laboratories worthy the name.

Clinical facilities: There are no adequate clinical or dispensary facilities.

Date of visit: May, 1909.

(10) HAHNEMANN MEDICAL COLLEGE OF THE PACIFIC. Established 1881. Homeopathic. An independent school.

Entrance requirement: "High school graduation or equivalent."

Attendance: 23.

Teaching staff: 35, 13 being professors, none of them full-time teachers.

Resources available for maintenance: The institution has practically no resources but fees, amounting to \$2685 (estimated).

Laboratory facilities: The school occupies a small, well kept building containing the usual dissecting-room, a laboratory for elementary chemistry, one fairly equipped laboratory in common for histology, bacteriology, and pathology, and a small orderly library.

Clinical facilities: Several neatly kept but inadequately equipped rooms are set aside for a dispensary; the attendance is fair, the records meager. The main clinical reli-

¹ During four months of 1909, there was a daily average of 60.

ance now is on a small number of beds paid for by the city in the Hahnemann Hospital, a modern institution close by.¹

Date of visit: May, 1909.

General Considerations

CONSIDERATION of medical education in California may well start from the fact that, without taking into account the osteopaths—who abound—the state has now one physician to every 401 inhabitants, that is, in round numbers, about four times as many doctors as it needs or can properly support. Such an enormous disproportion can hardly be rectified within less than a generation; it makes radical measures in the interest of sound medical education not only immediately feasible, but urgently necessary.

Legal enactment fixing a sound basis for future practitioners, of whatever school, the grant of authority to the state board to close schools flagrantly defective in either laboratory or clinical facilities, or the institution of practical examinations for license,—any one of these measures would at once wipe out at least seven of the ten existing schools, with distinct advantage to the public health of the state. As none of these schools has the resources indispensable to meet the rising tide in medical education, this outcome is in any case inevitable; legal regulation of the type indicated would merely hasten the day.

Even then the situation of medical education in the state is not altogether clear. The University of California has not yet solved its problem. The sums it now devotes to medical education are relatively small; its clinical facilities in San Francisco are inadequate; it has not effectively organized what it there offers; it has not brought about team work between the two severed branches that constitute the department. If now it has proved difficult to perfect an organization covering two places separated by San Francisco Bay, what reason is there to be confident when the distance involved is five hundred miles? Nor does any practical need compel a step educationally questionable. The attendance in Los Angeles in the last two years on a high school or equivalent basis is less than thirty; it will fall still lower when the two-year college basis is enforced and transplantation from Berkeley to Los Angeles is required at the beginning of the third year. Moreover, the clinical prospects are by no means up to university standard. The dispensary may indeed be adequately developed, but one hundred beds in the general medical and surgical wards of an old-fashioned public hospital, however supplemented by courtesies elsewhere, constitute a fragile support for a university department of medicine. The difficulty of controlling the teaching at Los Angeles by the scientific ideals of the university at Berkeley can hardly be overstated. Finally, with the present needs of the clinical department at San Francisco, it is not likely that the university can divert to Los Angeles the sums necessary to create a satisfactory department there. The move is explained on the

¹ During four months of 1909 there was a daily average of 55 city patients.

ground that peculiar conditions exist in the state; it is, however, not clear why a long narrow state is educationally in any different plight from a short broad one; in either case, needless multiplication of medical schools is economically wasteful and professionally demoralizing.

The university has undertaken to dominate two detached clinical departments, manned by local practitioners. There is nothing in the present status of detached clinical departments of this type to encourage confidence in the outcome. Before too far committing itself to this policy, it is at least worth inquiring into the advisability of concentrating its medical instruction across the bay, where a population of over two hundred thousand affords sufficient clinical material, and where a compact, effective, and organically whole university department of medicine, with a faculty, laboratory and clinical, selected on educational principles, could be readily developed.

These considerations apply in some respects with equal force to the action of Stanford University in taking over the Cooper Medical College at San Francisco. It was well enough to offer the laboratory sciences at Palo Alto, where the resources and ideals of the university insure high-grade instruction; but the entrance of the university into the San Francisco field in all probability portends the division and restriction of whatever opportunities the city may hereafter create. Lane Hospital can be developed into a teaching hospital of adequate size only if very large sums are available for the purpose; its organization and conduct have been in the past pedagogically very defective; and the clinical professors so far appointed have been taken with one exception from the former Cooper faculty. With one university medical school already on the ground, a second—and a divided school at that—is therefore a decidedly questionable undertaking. There is no need of it from the standpoint of the public; it must, if adequately developed, become a serious burden upon the finances of Stanford University. If the experience of other schools and cities is to be heeded, the question arises whether Stanford would not do well to content itself with the work of the first two years at Palo Alto, and to coöperate with the state university in all that pertains to the clinical end.

The situation just presented deserves to be studied carefully by all interested in medical education. What has happened in California is likely to happen elsewhere. Scores of schools are beginning a desperate struggle for existence. Their first impulse is to throw themselves into the lap of some prosperous university. The universities, not as yet themselves realizing that medical education is no longer either profitable or self-supporting, are prone to complete themselves by accepting a medical department as an apparent gift. From the standpoint of the university this blunder will soon prove a serious drain, as increased expenditure on instruction and reduced income from fees reveal the actual state of affairs. From the standpoint of medical education and practice, the tendency in question is still more deplorable. The curse of medical education is the excessive number of schools. The situation can improve only as weaker and superfluous schools are extinguished.

COLORADO

Population, 653,506. Number of physicians, 1690. Ratio, 1: 328.

Number of medical schools, 2.

DENVER: *Population*, 158,329.

(1) DENVER AND GROSS COLLEGE OF MEDICINE. Organized by consolidation 1902. Nominally the medical department of the University of Denver, with which institution it has, however, only a six months' contract; to all intents and purposes, a proprietary school, managed by its own faculty.

Entrance requirement: Less than high school graduation, loosely enforced.

Attendance: 109, over one-half from Colorado.

Teaching staff: 44 professors and 35 of other grade, none of them giving their whole time to teaching.

Resources available for maintenance: The school has no resources but fees, amounting to \$12,624 per annum (estimated).

Laboratory facilities: Its equipment consists of a chemical laboratory of the ordinary medical school type, a dissecting-room, containing a few subjects as dry as leather, a physiological laboratory with slight equipment, and the usual pathology and bacteriology laboratories. There is a total absence of scientific activity. The rooms are poorly kept. A few cases of books are found in the college office behind the counter.

Clinical facilities: The college owns a new and exceedingly attractive dispensary building. Separate rooms nicely equipped are occupied by the various specialties. The attendance averages 90 a day; the records are inadequate. There is an out-patient obstetrical service.

For hospital facilities the school depends largely on the County Hospital, the management of which is political. Clinics are held daily from 8.30 to 10, "purely through courtesy." Students from all schools merely "look on;" they are "not much at the bedside." Obstetrical work is limited, post-mortems rare. Hospital staff appointments are secured through "pull;" the college must take into the faculty the men who are already on the hospital staff. Supplementary opportunities are furnished by several local institutions. In several of these, however, the clinics are not regularly scheduled: "announcements appear upon the bulletin board of the college."

Date of visit: April, 1909.

BOULDER: *Population*, 9,652.

(2) UNIVERSITY OF COLORADO SCHOOL OF MEDICINE. Organized 1888. An integral part of the university.

Entrance requirement: A four-year high school education or its equivalent. Credentials are passed on by the dean.

Attendance: 85.

Teaching staff: 45, of whom 25 are professors, 20 of other grade.

Resources available for maintenance: The school is supported out of the total university income of \$200,000 per annum. Its fee income is \$4043; its budget, \$28,000.

Laboratory facilities: The school is in general satisfactorily equipped to do undergraduate teaching in the medical sciences. Full-time men are in charge of pathology, bacteriology, and physiology, though the departments lack trained assistants. Histology and embryology are taught in the department of biology. The chair of anatomy is occupied by a non-resident surgeon. There is a good library, with a subscription list including the best German and English journals. A regular fund is available for the purchase of books and apparatus.

Clinical facilities: The university hospital is entirely inadequate, even though the school is small. It contains 35 beds and averages 16 patients available for teaching. Its management has only recently been modernized. It now contains a clinical laboratory where students work, keeping excellent records of their findings. There are from 12 to 15 obstetrical cases annually in the hospital; these are supplemented by an out-patient service.

The dispensary is slight.

Date of visit: April, 1909.

General Considerations

THE state is overcrowded with doctors. It can therefore safely go to a higher standard; indeed, the new law provides that after 1912, all applicants for license must have had, previous to their medical education, a year of college work. As this is a practice, and not an educational, requirement, the Denver school may still continue to train low-grade men for adjacent states;¹ but it is probable that if it continues on a standard below the legal practice minimum, it will be too discredited, and if it arises to the aforesaid minimum, too much reduced, to continue. The state university alone, so far as we can now see, can hope to obtain the financial backing necessary to teach medicine in the proper way regardless of income from fees, and to it a monopoly should quickly fall. Its laboratory facilities are steadily increasing, but adequate clinical resources are not at present assured. It is important, therefore, that as a first step the state university gain access to the clinical facilities at Denver, from which it is now cut off, first, by a constitutional provision forbidding the state university to teach except at Boulder, second, by the fact that the City Hospital is

¹ It is, however, equally in the interest of these states that a further low-grade supply should be cut off. Though none of the following states has a medical school, all have too many doctors. The ratios are: Wyoming, 1: 541; Arizona, 1: 697; Idaho, 1: 663; New Mexico, 1: 618.

in the hands of the local school. These conditions, so common in American cities, are plainly against the general interest of the community. It may be that an arrangement can be made by which the Denver and Gross school will be handed over to the university, thus clearing the field of all obstacles to the upbuilding of a creditable school; for as Boulder is practically a suburb of Denver, the difficulties in the way of effective management at Denver are not insuperable. Whether the entire medical school shall be permanently concentrated at Denver or, following the Ann Arbor plan, a liberally supported hospital at Boulder be relied on to overcome the disadvantage of location in the matter of clinical material, need not be decided just now. The important steps to take at this moment comprise (1) passage of the constitutional amendment opening the clinical facilities of Denver to the state university, (2) more liberal state appropriations for the medical school, and (3) the consolidation of the Denver and Boulder schools as the medical department of the state university.¹

CONNECTICUT

Population, 1,054,366. Number of physicians, 1424. Ratio, 1 : 740.

Number of medical schools, 1.

NEW HAVEN: *Population*, 130,027.

YALE MEDICAL SCHOOL. Organized 1813. An organic part of Yale University.

Entrance requirement: Two years of college work, enforced with such unusual conscientiousness that in passing from the high school to the college standard this year, deficient members of last year's class were refused re-admission. Moreover, the advanced requirement has been actually exacted; out of an entering class of 23, one only is conditioned,—in part of biology. This is probably the lowest percentage of "conditions" that the country affords.

Attendance: 138; 72 per cent from Connecticut.

Teaching staff: 64, 14 being professors. Of these, the teachers in the fundamental branches devote full time to instruction, though they are overworked and without a proper force of assistants; in the clinical branches, the professor of medicine with two assistants is salaried. Small sums are also paid to a few other teachers in the clinical years.

Resources available for maintenance: Fees amounting to \$15,325, income from endowment amounting to \$10,000, university appropriation of \$17,986, making annual budget \$43,311.

Laboratory facilities: Well equipped student laboratories for organic chemistry,

¹As this Report goes to press, announcement is made that a consolidation of the Denver and Gross School with the medical department of the state university has been arranged.

physiology, and pharmacology; the provision for bacteriology, pathology, and anatomy is less satisfactory. In physiology alone is there internal evidence of progressive activity. The instructors in other branches are overworked, being called on to carry the routine work of extensive subjects in all their parts without adequate assistance. Under such circumstances, the work, however conscientious, is bound to be limited.

Clinical facilities: The New Haven Hospital, in which the school controls a small number of beds, is very intelligently employed. The obstetrical and gynecological wards, however, are not used for teaching; nor is there a contagious disease pavilion. Post-mortems are scarce. Clinical laboratories and teaching-rooms have been improvised close by the hospital; students are thereby enabled to do the clinical laboratory work in connection with assigned cases. Provision is also made there for the independent work of the professors of medicine and surgery.

The dispensary occupies a new and excellent building, but lacks systematic organization as a teaching adjunct. The attendance is adequate; but as the staff service is gratis, it varies greatly in quality in various departments.

Date of visit: January, 1910.

General Considerations

As the school now stands, it would, in point of facilities, still have to be classed with the better type of those on the high school basis; for, though it has advanced to a two-year college basis, there has been as yet no corresponding improvement of facilities. In order to deserve the higher grade student body which it invites, a more liberal policy ought to be pursued. The laboratory branches ought to be better manned, so that the instructors may create within them a more active spirit. A university department of medicine cannot largely confine itself to routine instruction,—certainly not after requiring two years of college work for admission to its opportunities. For the same reason the clinical facilities should be extended, probably through a more intimate connection with the present hospital. Its wards should be more generally used; more beds should be made accessible within them; and the missing pavilion for contagious diseases be provided. Enough money ought to be spent on the dispensary to ensure in every department systematic and thorough discipline, in examining patients, keeping records, etc.

To make these improvements, larger permanent endowment is required. As the school is one of a very few in New England so circumstanced as to have a clear duty and opportunity, it behooves the university to make a vigorous campaign in behalf of its medical department.

[For general discussion see "*New England*," p. 261.]

DISTRICT OF COLUMBIA

Population, 322,212. Number of physicians, 1231. Ratio, 1: 262.

Number of medical schools 3, plus two postgraduate (Army and Navy Medical) schools.

WASHINGTON: Population, 327,044.

(1) **GEORGE WASHINGTON UNIVERSITY, DEPARTMENT OF MEDICINE.** Organized 1825.
Now an integral department of the university.

Entrance requirement: Less than a four-year high school course.

Attendance: 117.

Teaching staff: 69 instructors, 25 being professors, none of whom is a full-time teacher; three instructors of other grade devote entire time to the school.

Resources available for maintenance: The school budget calls for \$23,779; its income in fees is \$21,833; the hospital is self-supporting.

Laboratory facilities: The laboratories of physiology, pathology, chemistry, and anatomy are well equipped; the building is admirably kept, and there is evidence of independent activity on the part of the several instructors. Animals are provided; there is a fair library enjoying a small annual appropriation, and a small but attractive museum. Post-mortems are scarce.

Clinical facilities: The University Hospital and Dispensary, under complete control, adjoins the medical school; 56 beds are available for teaching purposes. The staff has been recently reorganized on modern lines in order to increase the scope of bedside work. Supplementary opportunities are furnished under the usual conditions by several other hospitals.

The dispensary has an annual attendance of something over 1000.

Date of visit: March, 1909.

(2) **GEORGETOWN UNIVERSITY SCHOOL OF MEDICINE.** Organized 1851. A university department in name only.

Entrance requirement: Less than a four-year high school course.

Attendance: 89.

Teaching staff: 74, of whom 20 are professors; no one gives whole time to the medical school, except the dean, who has the chair of hygiene and is treasurer of both medical and dental schools.

Resources available for maintenance: Fees only, amounting to \$11,000 a year.

Laboratory facilities: The equipment consists of a good dissecting-room, a single

fairly well stocked laboratory for pathology, bacteriology, and histology, a fair equipment for experimental physiology, and an ordinary chemical laboratory. There is no library accessible to students, no museum, and no pharmacological laboratory.

Clinical facilities: The school has recently built a hospital, in which there are 100 ward beds, not free, but available for clinical use. It is several miles distant. The usual supplementary clinics are held in other places also. A few rooms at the hospital are set aside for a dispensary; the attendance is small.

Date of visit: March, 1909.

(3) HOWARD UNIVERSITY MEDICAL COLLEGE. Organized 1869. An integral part of Howard University.

Entrance requirement: A high school course or its equivalent.

Attendance: 205, most of whom are working their way through. Practically all the students are colored.

Teaching staff: 52, 22 being professors, 30 of other grade.

Resources available for maintenance: The school budget calls for \$40,000, of which \$26,000 are supplied by student fees, most of the remainder by government appropriation. Though the school has been changed from a night to a day school, the fees raised from \$80 to \$100, and the admission requirements stiffened, the attendance has nevertheless increased.

Laboratory facilities: The laboratory equipment includes anatomy, pathology, histology, bacteriology, and chemistry. There is no organized museum, though the school possesses a number of specimens, normal and pathological, charts, models, etc.

Clinical facilities: Clinical facilities are provided in the new, thoroughly modern, and adequate government hospital of 278 free beds, with its dispensary, closely identified with the medical school. A pavilion for contagious diseases alone is lacking.

Date of visit: January, 1910.

(4) ARMY MEDICAL SCHOOL. Organized 1822. Offers laboratory courses, covering eight months, to candidates who have passed their preliminary examinations as army surgeons.

Attendance: 57.

Teaching staff: 10 instructors, detached from the army for the purpose.

Laboratory facilities: Excellent teaching and working laboratories in cramped quarters are provided in the building occupied by the great library and museum of the Surgeon-General's office.

Date of visit: January, 1910.

(5) NAVY MEDICAL SCHOOL. Offers laboratory courses, covering six months, to candidates who have passed preliminary examinations as navy surgeons.

Attendance: 20.

Teaching staff: Several instructors, detached from the service for three years or less.

Laboratory facilities: Good teaching and working laboratories are provided in the building formerly used for the naval observatory.

Date of visit: January, 1910.

General Considerations

OF the medical schools in Washington, Howard University has a distinct mission—that of training the negro physician—and an assured future. The government has to some extent been the patron of the institution, and has done its medical department an incalculably great service by the erection of the Freedman's Hospital. Sound policy—educational as well as philanthropic—recommends that this hospital be made a more intimate part of Howard University, so that students may profit to the uttermost by its clinical opportunities. Its usefulness as a hospital in its immediate vicinity will be thereby increased; and its service to the colored race at large will be augmented to the extent to which it is used to educate their future physicians.

The other two schools lack adequate resources as well as assured prospects. They are surrounded by medical schools—those of Richmond, Baltimore, Philadelphia—whose competition they cannot meet. Finally, the District of Columbia has relatively more physicians than any other part of the country. Should the District require, as it ought, a higher basis, or even enforce an actual four-year high school standard, both would suffer seriously. Neither school is now equal to the task of training physicians of modern type.

GEORGIA

Population, 2,557,412. Number of physicians, 2887. Ratio, 1: 886.

Number of medical schools, 5.

ATLANTA: Population, 118,243.

(1) ATLANTA COLLEGE OF PHYSICIANS AND SURGEONS. Organized through merger, 1898.

An independent school.

Entrance requirement: Nominal.

Attendance: 286, about 63 per cent from Georgia.

Teaching staff: 51, of whom 20 are professors. None of the teachers devotes full time to the school.

Resources available for maintenance: The school has practically no resources but fees, amounting to \$28,000.

Laboratory facilities: It is perhaps the best equipped of all the schools of its grade; it has good buildings, containing a good dissecting-room,—dissecting material, however, somewhat scarce,—a fairly equipped laboratory for physiology and physiological chemistry, one of the same character for histology and pathology, and a separate laboratory, well equipped, for bacteriology. Unfortunately, the school has no full-time instructors in these branches, so that, what with practitioner teachers and an inferior student body, the equipment cannot be used at its real value. There is a small library, but no museum.

Clinical facilities: Hospital facilities are furnished by the Grady (free city) Hospital, close by. Except in obstetrics, to which department students are not admitted, the clinical material is fairly abundant; but it cannot be effectively used,¹ and the students are so unappreciative of their opportunities that attendance in the wards is very irregular.

In the school building a large suite of rooms is set aside for a dispensary. The attendance is ample, the methods old-fashioned.

Date of visit: January, 1909.

(2) ATLANTA SCHOOL OF MEDICINE. Organized 1905. An independent school.

Entrance requirement: Nominal.

Attendance: 230; not quite 70 per cent from Georgia.

Teaching staff: 44, of whom 17 are professors, no one devoting whole time to the school.

Resources available for maintenance: Fees and gifts, amounting together to \$20,000—\$25,000 annually.

Laboratory facilities: Its laboratory equipment is slight, though it possesses some features uncommon in schools of its type,—an excellent projectoscope, an X-ray machine, and a small, useful library. There is no museum.

Clinical facilities: A suite of rooms in fair condition only is provided for a dispensary. Likewise, in the basement of the college, two wards, containing 20 beds, have been arranged; so far as they go, they are fairly well used. For the rest of its clinical instruction the school depends mainly on the Grady Hospital, so far off, however, that the students do not conscientiously attend.

Date of visit: January, 1909.

(3) GEORGIA COLLEGE OF ECLECTIC MEDICINE AND SURGERY. Organized 1877. An independent institution.

¹The consent of ward patients must be obtained before bedside instruction can be given.

Entrance requirement: Nominal.

Attendance: 66.

Teaching staff: 20, of whom 14 are professors and 6 of other grade.

Resources available for maintenance: Fees, amounting to \$5655 (estimated).

Laboratory facilities: The school occupies a building which, in respect to filthy conditions, has few equals, but no superiors, among medical schools. Its anatomy room, containing a single cadaver, is indescribably foul; its chemical "laboratory" is composed of old tables and a few bottles, without water, drain, lockers, or reagents; the pathological and histological "laboratory" contains a few dirty slides and three ordinary microscopes.

Clinical facilities: The school is practically without clinical facilities. Its outfit in obstetrics is limited to a tattered manikin.

Nothing more disgraceful calling itself a medical school can be found anywhere.

Date of visit: February, 1909.

(4) HOSPITAL MEDICAL COLLEGE. Eclectic. Organized 1908. This institution occupies the rear of a private infirmary. Started in 1908 "on four weeks' notice" by seceders from the Georgia College of Eclectic Medicine and Surgery (*see* (3) *above*), it graduated 17 doctors at the close of its first year.

Entrance requirement: Nominal.

Attendance: 43.

Teaching staff: 16, all of whom are professors.

Resources available for maintenance: Fees, amounting to \$3950 (estimated).

Laboratory facilities: In the matter of equipment, it is impossible to say what belongs to the school and what to the infirmary. At any rate, there is only one laboratory with any equipment worthy the name,—that of pathology and bacteriology.

Clinical facilities: The clinical facilities comprise the infirmary above mentioned, containing 16 beds. It is, of course, a pay infirmary.

Date of visit: February, 1909.

AUGUSTA: *Population*, 45,582.

(5) MEDICAL COLLEGE OF GEORGIA. Organized in 1828, it has been since 1873 nominally the medical department of the state university; but it is entirely controlled by its own separate board, and "no liability for its debts or expenses shall be incurred by the university."¹ The institution is therefore in effect a proprietary school.

¹ Agreement between Medical College of Georgia and University of Georgia, article 4.

Entrance requirement: Nominal.

Attendance: 99, mostly from Georgia. Twenty-six of these hold free county scholarships, in addition to which number the dean admits as many more as he pleases, generally at the request of congressmen. Eighteen students were admitted free in this way last year. Hence 44 of the 99 students are free.

Teaching staff: 33, of whom 18 are professors.

Resources available for maintenance: The institution has no resources but fees, amounting to \$6835.

Laboratory facilities: The school occupies a building which contains an exceedingly foul dissecting-room, a meager equipment for elementary chemistry, a fair equipment for histology and pathology, and practically nothing for bacteriology. There is a small museum and a collection of several thousand books of mainly antiquarian interest.

Clinical facilities: The city hospital adjoining, containing 100 beds,—less than half of them occupied at the time of the inspection,—offers most of the clinical facilities; the Lamar Hospital is also available, but is more than a mile off, though described in the official catalogue of the state university as “located only a short distance from the college.” At the city hospital the students get no obstetrical work because “the cases mostly come at night and you can’t get the students;” at the Lamar Hospital they get none because “they are too busy.” There is no evidence anywhere of clinical laboratory work. It was learned that at the city hospital there had been “two post-mortems in six years.”

There is a dispensary at the city hospital, but no records are kept.

Date of visit: February, 1909.

General Considerations

THE situation to be dealt with in this state is so simple that there is no room for difference of opinion as to what ought to be done. That every state in the south is overcrowded with doctors is generally admitted. Florida alone of surrounding states lacks a medical school, and there is an excess of doctors there (ratio 1: 865). The two eclectic schools, as utterly incapable of training doctors, should be summarily suppressed. The Augusta situation is hopeless. There is no possibility of developing there a medical school controlled by the university. The site is unpropitious, the distance too great. The university ought not much longer permit its name to be exploited by a low-grade institution, whose entrance terms—if the phrase can be used—are far below that of its academic department. It should snap the slender thread; the medical school will not long survive amputation.

Two schools remain at Atlanta, a growing city in close proximity to the university at Athens. It would be easy to consolidate these two institutions to form the

medical department of the University of Georgia. The department could immediately adopt the general entrance requirements of the university, to be enforced by the university authorities. The faculty should, of course, be reconstructed and governed without restriction on university lines. The city's growth ensures a fair clinic and probably material aid.

ILLINOIS

Population, 5,717,229. Number of physicians, 9744. Ratio 1: 586.

Number of medical schools, 14, plus 4 postgraduate schools.

CHICAGO: *Population, 2,282,927.*

- (1) RUSH MEDICAL COLLEGE. A divided school. Since 1900 the instruction of the first and second years has been given wholly at the University of Chicago, of which it is an integral part; the third and fourth years, given at the Cook County, the Presbyterian, and the Children's Memorial Hospitals and in the laboratory buildings adjoining them, are merely affiliated with the university. Pedagogically, the two branches do not form an organic whole.

Entrance requirement: Two years of college work, strictly enforced, though a considerable part of the entering class is conditioned in part of the scientific requirement.

Attendance: 488.

Teaching staff: 89 professors and 141 of other grade: total 230. The laboratory work is in charge of men devoting their entire time to teaching and research.

Resources available for maintenance: The instruction provided by the university is paid for out of the university funds and costs annually \$45,738; the clinical division, carried by student fees and by contributions, costs \$36,714: a total cost of \$82,452. The total income in fees is \$60,485.

Laboratory facilities: The laboratory branches are most liberally provided for on the university grounds; the laboratories are complete in number and equipment, each manned by a full staff, all the members of which are engaged in investigation as well as in teaching. There is considerable difference of opinion among those engaged in teaching the scientific subjects as to how far the presentation should be deliberately medical in aim.

Clinical facilities: Clinical facilities are provided by the Presbyterian Hospital, the staff of which is the faculty of the Rush Medical School, by the Cook County Hospital, and by other connections. The Presbyterian Hospital is an important adjunct, though thus far it is not by any means a genuine teaching hospital. It contains about 150 beds available for instruction. The Cook County Hospital will

be discussed in connection with the general state situation. It is sufficient to say here that its abundant material is in a high degree valuable, though serious limitations upon its use exist. Rush holds 21 staff appointments.

Dispensary facilities are entirely adequate.

Date of visit: April, 1909.

(2) NORTHWESTERN UNIVERSITY MEDICAL DEPARTMENT. Organized 1859, it has borne its present title since 1891. An integral part of the university.

Entrance requirement: One year of college work, hitherto loosely enforced.

Attendance: 522.

Teaching staff: 54 professors and 89 of other grade: 143 in all, ten of whom devote their entire time to the school.

Resources available for maintenance: Except for two professorships, endowed to the extent of \$60,700, the department lives on and pays for plant addition out of its fees now amounting to \$89,076.

Laboratory facilities: The school has the necessary laboratories, well equipped for routine work; more could be done but that the full-time teachers lack the necessary assistants.

Clinical facilities: These are provided by Mercy Hospital, Wesley Hospital, the Cook County Hospital, and other institutions. The Wesley Hospital, the staff of which comes wholly from the faculty of this school,¹ contains 80 free beds. It is, however, not primarily a teaching hospital, though it might apparently be reorganized as such with much advantage both to itself and to the medical school. The Cook County Hospital will be discussed below; Northwestern holds 12 staff appointments there. In general, material is abundant in amount and variety; the defects of the situation arise from the lack of financial resources and pedagogical control.

Dispensary requirements are amply met.

Dates of visits: April, 1909; December, 1909.

(3) COLLEGE OF PHYSICIANS AND SURGEONS. Organized in 1882; since 1896 nominally the medical department of the University of Illinois, with which, however, only a contractual relation exists.

Entrance requirement: A high school education or its equivalent, the latter hitherto very loosely interpreted, though somewhat stricter action has been enforced this year. The policy of the institution had been to accept students who satisfied the Illinois law as administered by the present state board; the requirement has, therefore, been more or less nominal. Advanced standing has been accorded to students from decidedly inferior schools, some of them among the worst institutions

¹ Students from the American Medical Missionary College attend certain clinics.

in the country. These students were examined, only those who passed being accepted; but the fact that, with the teaching they have had, they can pass is conclusive as to the nature of the examination.

Attendance: 517, about 60 per cent from Illinois.

Teaching staff: 198, of whom 42 are professors, 156 of other grade.

Resources available for maintenance: The institution is practically dependent on its fees, amounting to \$80,155 (estimated), and has a large floating debt.

Laboratory facilities: The school has the following laboratories: physiology, well equipped; pharmacology and chemistry, mediocre; anatomy, pathology, and bacteriology, adequate. There are full-time professors of anatomy and physiology, without skilled assistants or helpers. Their work is limited to routine. The school has a large library.

Clinical facilities: For these the school relies on the Cook County Hospital, on the staff of which it holds 11 appointments, and on a number of other institutions to which its students are admitted under the usual limitations. Prominent among these is the so-called "University Hospital," which may be cited as a typical instance of the misleading character of catalogue representations. The title itself is a misnomer; for the hospital is a university hospital not in the sense that large teaching advantages exist for the benefit of the university, but only in the sense that to the existing opportunities, restricted as they are, students from other schools are not admitted at all. The catalogue states that "it contains one hundred beds, and its clinical advantages are used exclusively for the students of this college." Not, however, the "clinical advantages" of the "one hundred beds," for 52 of them are private. Its "clinical advantages" shrink on investigation to three weekly amphitheater clinics of slight pedagogic value and four ward clinics in obstetrics, —each of the latter attended by some 12 or 14 students in a ward containing 18 beds. Supplementary connections give access to large surgical clinics.

The dispensary service is in general adequate.

Dates of visits: April, 1909; December, 1909.

(4) CHICAGO COLLEGE OF MEDICINE AND SURGERY. Organized 1901, and since 1902 the medical department of Valparaiso (Indiana) University; up to 1905 an eclectic institution.

Entrance requirement: A high school education or its equivalent, interpreted to include anything that the state board will accept.

Attendance: The school had an enrolment of 315 in 1907-8, and of 366 in 1908-9, the senior class of the former year numbering 95, the freshman 69. This disproportion is largely due to the fact that advanced standing has been indiscriminately granted to students who had previously attended low-grade institutions, some of

them now defunct. Credit has been allowed to former students of even the worst of the Chicago night schools.

Teaching staff: The school has a faculty of 71, of whom 37 are professors. There are no full-time teachers, though some of the scientific branches are taught by full-time teachers of Valparaiso University, who come to the Chicago department on certain days weekly.

Resources available for maintenance: Fees, amounting to \$48,430 (estimated).

Laboratory facilities: The equipment throughout is ordinary, the usual laboratories being provided. There are few teaching accessories.

Clinical facilities: Clinical facilities are inadequate, being limited in the main to an adjoining hospital of 75 beds, of which one-fourth can be used for teaching, and to the Cook County Hospital, on the staff of which the school has two representatives.

The dispensary has a fair attendance and is in some respects well organized.

Date of visit: April, 1909.

(5) BENNETT MEDICAL COLLEGE. Organized 1868, and up to 1909 an eclectic school. A stock company, practically owned by the dean of the school: "there are enough others to legalize the thing."

Entrance requirement: Nominal compliance with the Illinois law on the subject. A pre-medical department,—Jefferson Park Academy,—recruited by solicitors, has been organized by way of feeding the medical school. A vigorous advertising and soliciting system is operated.

Attendance: 181; about one-half from Illinois.

Teaching staff: 42, of whom 21 are professors.

Resources available for maintenance: Fees, amounting to \$19,380 (estimated).

Laboratory facilities: The school building is in wretched condition. One badly kept room is devoted to anatomy; it contained a few cadavers as dry as leather; another, in similar condition, is given to chemistry. There is slight provision for pathology and bacteriology; equipment for physiology is sufficient only for simple demonstrations. There are no teaching accessories worthy of mention.

Clinical facilities: These comprise a pay hospital of 45 beds, in which it is claimed that 20 are made available for teaching use by means of free medical (not hospital) services; and two places on the Cook County Hospital staff. The clinical facilities are utterly inadequate.

There is a small dispensary.

The institution is frankly commercial. Its change of name (dropping "eclectic") is a business move.

Date of visit: April, 1909.

(6) **AMERICAN MEDICAL MISSIONARY COLLEGE.** Organized 1895. This school gives the bulk of its instruction at Battle Creek, Michigan, which see for complete account.

(7) **JENNER MEDICAL COLLEGE.** Organized 1892. A night school, occupying three upper floors of a business house. An independent institution.

Entrance requirement: Nominal compliance with state law. A one-year pre-medical class is operated by way of satisfying the law.

Attendance: 112.

Teaching staff: 37, of whom 28 are professors.

Resources available for maintenance: Fees, amounting to \$12,880 (estimated).

Laboratory facilities: The equipment consists of a meager outfit for chemistry, a somewhat better equipment for physiology, though no animals were to be seen, and a slight outfit for pathology and bacteriology. Anatomy is taught by lectures "with the cadaver" from the beginning of the year until May 15, after which there is "dissecting until the close of the year."

Clinical facilities: Clinical facilities are practically nil,—one or two night clinics being all that the school claims to offer. The school once had access to Grace Hospital, a private institution of 30 beds; but it has recently been turned out for failure to pay for the privilege.

The dispensary attendance varies from two to ten, four nights weekly. No particular rooms for dispensary purposes are provided: "patients are taken right into the rooms where the classes are."

An out-and-out commercial enterprise. The instruction is plainly a quiz-compend drill aimed at the written examinations set by the state board of Illinois and of other states. The possibility of teaching medicine acceptably in a night school is discussed below (p. 216, note).

Date of visit: April, 1909.

- (8) **ILLINOIS MEDICAL COLLEGE.** Organized 1894. }
 (9) **RELIANCE MEDICAL COLLEGE.** Organized 1907. }

These two schools are bracketed because they are only different aspects of one enterprise worked in two shifts, one body of students attending by day, the other by night. The plant is thus in "continuous performance." It is owned by its president, who is in the main assisted in the scientific branches by recent college graduates, to whom small sums are paid; in the clinical branches by young physicians who

tender their services gratis in order to "work up their business." The day school is affiliated with Loyola University.

Entrance requirement: Of the kind usual in Illinois commercial medical schools. A pre-medical class, running three hours each night, covers in one year the work of two high school years. A boy who is engaged all day in trade can thus "finish" two years' English, Latin, and mathematics at night in a single session. It is probable that the pre-medical course will be lengthened to two such years, "equivalent" to an entire high school course according to the "Illinois idea."

Attendance: Reliance Medical College, 88; Illinois Medical College, 69.

Teaching staff: The night medical school (Reliance) has a faculty of 44, 23 being professors; the day branch (Illinois Medical) has a faculty of 73, 38 being professors.

Resources available for maintenance: Fees, amounting to \$9945 (Reliance, estimated); \$9175 (Illinois, estimated).

Laboratory facilities: The equipment conforms to legal stipulations: there is a library, the beginnings of a museum, an ordinary dissecting-room, a small amount of apparatus for physiology, and fair laboratories, as things go, for chemistry, histology, pathology, and bacteriology. The laboratories are in good condition and are really used.

Clinical facilities. Day students: Some eight or ten hours weekly for junior and senior classes in scattered hospitals; work almost wholly surgical; one to two hours daily in the dispensary in the college building. Students see no contagious diseases; obstetrical work is all out-patient. *Night students:* About six hours weekly at the Cook County Hospital between 6.30 and 9.30 p.m., opportunities being limited to looking on at surgical work; dispensary, nightly. The night students see no children's diseases, no acute medical diseases at the bedside, no contagious diseases.

Dates of visits: April, 1909; December, 1909.

(10) NATIONAL MEDICAL UNIVERSITY. A night school, organized in 1891 as "homeopathic," which word was subsequently dropped. Ostensibly the medical department of the "Chicago Night University," which claims departments of arts, law, dentistry, pharmacy, etc. The school appears to be owned by the "dean."

Entrance requirement: Entrance is on the same basis as in other night schools; a "preparatory department" is also in operation.

Attendance: 150. "Free transportation from Chicago to Vienna by way of New York, London, Paris," etc., is offered to any graduate who has for "three years or more paid regular fees in cash."

Teaching staff: 36.

Resources available for maintenance: Fees, amounting to \$22,500 (estimated).

Laboratory facilities: The school occupies a badly lighted building, containing nothing that can be dignified by the name of equipment. There had been no dissecting thus far (October to the middle of April), anatomy being didactically taught. Persistent inquiry for the "dissecting-room" was, however, finally rewarded by the sight of a dirty, unused, and almost inaccessible room containing a putrid corpse, several of the members of which had been hacked off. There is a large room called the chemical laboratory, its equipment "locked up," the tables spotless. "About ten" oil-immersion microscopes are claimed—also "locked up in the storeroom." There is not even a pretense of anything else. Classes in session were all taking dictation.

Clinical facilities: The top floor is the "hospital;" it contained two lonely patients. Access to a private hospital two miles distant is also claimed.

Recently this school has been declared by the Illinois State Board of Health as "not in good standing." The same action was taken once before, but was afterwards revoked; just why, it is impossible to find out; for the school was after the revocation just exactly what it was at the time of its suspension; and it is the same to-day.

Date of visit: April, 1909.

(11) COLLEGE OF MEDICINE AND SURGERY: PHYSIO-MEDICAL. Organized 1885. An independent school.

Entrance requirement: Such as satisfies the present interpretation of the law. A diligent search in the office desk and safe failed to discover any credentials of students now in the school.

Attendance: 33.

Teaching staff: 42, of whom 33 are professors.

Resources available for maintenance: The school has no resources but fees, amounting to \$2985 (estimated).

Laboratory facilities: The equipment is very meager.

Clinical facilities: Clinical facilities amount to little: there were in the hospital last year 167 patients, over one-half surgical; there is an annual attendance of 250 in the dispensary.

Date of visit: April, 1909.

(12) HERING MEDICAL COLLEGE. Homeopathic. Organized 1892. This school teaches homeopathic doctrine in its original purity.

Entrance requirement: "High school or equivalent."

Attendance: 32.

Teaching staff: 44, of whom 30 are professors.

Resources available for maintenance: Fees, amounting to \$3360 (estimated).

Laboratory facilities: The equipment is very meager.

Clinical facilities: These are very limited. Students are not admitted to the adjoining hospital. There is a small dispensary.

Date of visit: April, 1909.

(13) **HAHNEMANN MEDICAL COLLEGE.** Homeopathic. Organized 1859. An independent institution.

Entrance requirement: "High school or equivalent."

Attendance: 180.

Teaching staff: 84, of whom 38 are professors.

Resources available for maintenance: Fees, amounting to \$14,800 (estimated).

Laboratory facilities: The school occupies a building wretchedly dirty, excepting only the single laboratory, fairly equipped, devoted to pathology and bacteriology. The equipment covers in a meager way also anatomy, physiology, histology, chemistry.

Clinical facilities: In the adjoining hospital there are accommodations in the wards for 60 beds, but there are no ward clinics. The superintendent is a layman who "does not believe in admitting students to the wards. There is no regular way for them to see common acute diseases," as only amphitheater clinics are held. Hospital internes do all the obstetrical work; students "look on." The school also holds two appointments on the surgical side in the Cook County Hospital.

There is a fair dispensary.

Date of visit: April, 1909.

(14) **LITTLEJOHN COLLEGE OF OSTEOPATHY.** An undisguised commercial enterprise.

Entrance requirement: Nominal.

Attendance: 75.

Teaching staff: 43.

Resources available for maintenance: Fees, and income from patients.

Laboratory facilities: Practically none. At the time of the visit, some rebuilding was in progress, in consequence of which even such laboratories as are claimed were, except that of elementary chemistry, entirely out of commission and likely to remain so for months; but "teaching goes on all the same." Class-rooms were practically bare, except for chairs and a table.

Clinical facilities: The Littlejohn Hospital,—a pay institution of 20 beds, mostly sur-

gical,—which can be of little use. It was claimed, too, that “medicine and surgery are taught in the school,” and color is lent to the statement by the presence on the faculty of physicians teaching *materia medica*, etc.

Date of visit: December, 1909.

(15) THE POSTGRADUATE MEDICAL SCHOOL AND HOSPITAL. A stock company.

Teaching staff: 98.

Resources available for maintenance: Fees.

Laboratory facilities: A good working clinical laboratory.

Clinical facilities: The school offers clinical instruction in its own hospital, containing a small number of beds, and in other Chicago institutions. The instruction is attended by physicians for periods varying from a few weeks to a year.

Date of visit: April, 1909.

(16) CHICAGO POLYCLINIC. A postgraduate institution organized as a stock company. Offers special courses to graduated physicians.

Attendance: Perhaps 30 at any given time; a total of 350 in the course of a year.

Teaching staff: 92, 30 being professors, 62 of other grade.

Resources available for maintenance: Fees.

Laboratory facilities: A small clinical laboratory, the instruction in technique being given by a first-year student in one of the night schools; in the absence of the instructor, he also conducts classes.

Clinical facilities: The main reliance is the Polyclinic Hospital of 80 beds, two-thirds of them surgical.

Date of visit: December, 1909.

(17) CHICAGO EAR, EYE, NOSE, AND THROAT COLLEGE. A stock company offering courses in certain specialties.

Attendance: 20 on average; average period of residence, two months; a few remain six to twelve months.

Teaching staff: 22.

Resources available for maintenance: Fees.

Facilities: A fairly equipped dispensary with a daily attendance of 15 to 20 new patients; a hospital with 10 ward beds, empty at time of visit, “but full a week ago.” The work is all immediately practical; there are no facilities for fundamental or intensive instruction or effort.

Date of visit: December, 1909.

(18) ILLINOIS POSTGRADUATE SCHOOL. A stock company.

Entrance requirement: The M.D. degree.

Attendance: 6 to 8 at any given time.

Teaching staff: 86, of whom 26 are professors, 10 of other grade.

Resources available for maintenance: Fees.

Laboratory facilities: Practically none.

Clinical facilities: The school offers courses at the West Side Hospital, a private institution of 86 beds occupied mostly by surgical cases. There is a large dispensary.

Date of visit: December, 1909.

General Considerations

THE city of Chicago is in respect to medical education the plague spot of the country. The state law is fairly adequate, for it empowers the board of health to establish a standard of preliminary education, laboratory equipment, and clinical facilities, thus fixing the conditions which shall entitle a school to be considered reputable. In pursuance of these powers, the board has made the four-year high school or its equivalent the basis, and has enumerated the essentials of the medical course, including, among other things, clinical instruction through two annual terms.

With the indubitable connivance of the state board, these provisions are, and have long been, flagrantly violated. Of the fourteen undergraduate medical schools above described, the majority exist and prepare candidates for the Illinois state board examinations in unmistakable contravention of the law and the state board rules. These schools are as follows: (1) Chicago College of Medicine and Surgery (Valparaiso University), (2) Hahnemann Medical College, (3) Hering Medical College, (4) Illinois Medical College, (5) Bennett Medical College, (6) Physio-Medical College of Medicine and Surgery, (7) Jenner Medical College, (8) National Medical University, (9) Reliance Medical College, (10) Littlejohn College of Osteopathy. Of these, only one, the National Medical University, has been deprived of "good standing" by the state board. Without exception, a large proportion of their attendance offers for admission an "equivalent," which is not an equivalent in any sense whatsoever; it is nevertheless accepted without question by the state board, though the statute explicitly states that it can exact an equivalent by "satisfactory" examination. In the case of the night schools,¹ for instance, one or two years' requirements are satisfied

¹ Even supposing the night schools enforced an entrance standard and actually provided laboratories and hospitals of the right kind, the teaching of anything but didactic medicine at night is practically impossible, because: (1) The time is too limited. The day school is in operation all day long and the student has his evenings for study; the night school can at most secure three or four hours when the student is already physically fatigued. (2) Laboratory work by artificial light is bound to be unsatisfactory, even if the lighting is good, which is not usually the case. (3) Hospital clinics, operations, etc., must be very limited at night, when the interest of the patient requires that he be allowed to rest. Children's diseases cannot be studied at night at all. (4) The situation is rendered even more absurd by the fact that, in addition to all these handicaps, the night school student frequently has to make up some conditions in preliminary studies.

by "coaching" one night a week in each of the several subjects: one evening is devoted to Latin, the next to English, the next to mathematics. There is absolutely no guarantee that the candidate accepted on the equivalent basis has had an education even remotely resembling the high school training which the Illinois law intends as the minimum upon which it will recognize a candidate for the physician's license. If the state board should—as in duty bound—publicly brand these schools as "not in good standing" by reason of their failure to require a suitable preliminary education of their students, their graduates would be immediately excluded from practice in Illinois; adjoining states would rapidly follow suit, with the result that the schools would shortly be exterminated. Fortunately, the case against them does not rest alone on the question of entrance requirements: for not a single one of the schools mentioned furnishes clinical opportunities in proper abundance, and some of them even fail to provide the stipulated training in other branches, *e. g.*, anatomy. An efficient and intelligent administration of the law would thus reduce in short order the medical schools of Chicago to three, Rush, Northwestern, and the College of Physicians and Surgeons.¹ In the matter of entrance requirements, Rush alone is secure. The College of Physicians and Surgeons rests on the high school or equivalent basis; if a scholastic equivalent, such as would be acceptable to the academic department of the state university, is insisted on, the registration will be seriously diminished. Northwestern is in a similar plight: it requires now a high school education or equivalent, followed by a year of college which it does not get. If its standard were enforced, its present attendance would be considerably reduced. At both Northwestern and the College of Physicians and Surgeons the inequality and incapacity of the present student body are frankly conceded. "The facilities are better than the students," said a professor at the former; "the admission machinery does n't stop the unfit," said a professor at the latter. That both these schools will be driven by internal and external forces to a higher level, actually enforced, is inevitable. When that happens, their attendance will materially shrink; and as higher standards will check the invasion of medical schools by drifting waverers, and will tend to keep the number of doctors in more nearly normal relation to the needs of the population, it is not likely that either school will again attain its former size. This consideration is rendered additionally important because it portends a marked reduction in income through fees, upon which both schools still depend.

In the matter of teaching facilities, the three schools under discussion satisfy the law; but they satisfy the aspirations of their faculties only in varying degrees. The scientific work of the University of Chicago, relied on by Rush, is excellent; the provision made by Northwestern and the College of Physicians and Surgeons is distinctly inferior to it. Assuming that Northwestern will rise to an actual one or two year college basis, it must provide correspondingly increased facilities both for the higher grade students and for the more productive teaching body which these students will

¹ For the American Medical Missionary College, see "Michigan."

demand. There are, for instance, several full-time instructors, but they are without an adequate force of assistants. The needs of the College of Physicians and Surgeons are much greater. Its laboratory facilities and equipment are inadequate even for the present student body; and it has barely begun the development of a full-time teaching staff in the scientific branches. Both these schools face an era of increased investment in plant and of considerably augmented running expenses, coinciding with a period of reduced income from tuition fees.

On the clinical side, Rush and Northwestern do not differ substantially; the College of Physicians and Surgeons is somewhat inferior. Both Rush and Northwestern have an exclusive staff connection with certain hospitals. Their hospital situation is therefore, as things go in this country, tolerable. They command a sufficient number of cases, subject, however, to two defects that will be more acutely felt as clearer ideals become dominant in medical education: (1) they are not in position freely to import clinical teachers, nor (2) can they in general discontinue a professorial appointment without to the same extent abridging their clinical resources; none of them completely controls, even in a single hospital, the conditions under which clinical instruction is given.¹

The Cook County Hospital is common to all three. Its relations to the medical schools have been subject to variation and disturbance. The institution is conducted by a lay warden, who, though a politician, is now friendly to the schools. At present, the staff is selected by civil service examination every six years. Rush now holds twice as many appointments as either of the other two schools, a discrepancy that may be either emphasized, obliterated, or reversed at the next examination. The main clinical facilities of the several schools are thus precarious. They are also limited: a recent unpleasantness—due, according to one version, to a quarrel between certain doctors and some nurses who objected to the careless way in which the doctors replaced the bed sheets—has resulted in the exclusion of students from the wards. Patients are exhibited in rooms. The incident involves serious limitations upon teaching methods, and illustrates the uncertainty which attaches to mere privileges and courtesies. Cases cannot be assigned for intensive study to particular students; hospital residents make the records and do the clinical laboratory work. The undergraduate student can see conditions in abundance; he cannot at close range observe processes in development. The Cook County Hospital is therefore, from a strictly educational point of view, not a laboratory in which beginners can be trained in a thorough technique. It is, however, immensely valuable as a storehouse of illustrative material for students who have elsewhere received a satisfactory preliminary discipline.

None of the supplementary hospitals used by the schools cures these defects. They

¹ Rush comes nearest to desirable conditions at Presbyterian Hospital, for staff appointments there are by contract completely controlled by its faculty. But it is provided that "no patient shall be made the subject of clinical instruction without his or her consent."

are too small; their purpose is only secondarily educational; friction is liable to arise over efforts to retain patients for teaching purposes; the students remain more or less outsiders.

The modernization of medical education in Chicago requires, then, that two of the three schools in question should greatly strengthen their laboratory instruction, and that all three should strengthen their clinical instruction. The number of students to be provided for is a factor in determining a definite line of procedure. Rush has on its two-year college basis 488 students; Northwestern had in its first-year class, on a very loosely enforced one-year college basis, 66; the inevitable two-year standard will greatly reduce this number. Should the College of Physicians and Surgeons go to the two-year college standard,—an inevitable development if it lives,—it would suffer similarly. It seems fair to estimate, then, that the actual number of medical students in Chicago on a two-year college basis will not be too large to be cared for in a single school adequately equipped with laboratories and hospital. As medical education on the proper basis cannot be attempted outside a university, and as none of the three universities now teaching medicine in Chicago is likely to abandon the field to the others, it is suggested in the interest of efficiency and economy that (1) each of the three universities continue to provide—like the University of Chicago—the instruction of the first two years; (2) all three universities combine to form a clinical department under joint management, the first step towards which would be a concerted effort to procure a proper hospital for the use of third and fourth year men. The sum necessary to procure three such hospitals is so large that it is highly improbable that as separate institutions the schools can acquire separate and adequate clinical departments. Inasmuch as there is no demand for graduates exceeding the capacity of one clinical school, it would be sheer extravagance to equip three on the basis proposed. The Cook County and other hospitals would, on the suggested arrangement, play the part for which they are exactly suited in furnishing illustrative material for advanced students whose discipline had been elsewhere looked to, and in making possible the development of instruction for graduates in all the specialties,—a form of opportunity for which, just for lack of differentiation and organization, our physicians are still forced to go abroad. A great opportunity is thus fairly within the grasp of Chicago: the conditions to its realization are honesty and intelligence on the part of the state authorities, and coöperation between the three great universities of the state. The execution of this plan might set the country at large to thinking on the wisdom and necessity of coördinating our educational enterprises. Everywhere, thus far, our higher education has worn a competitive aspect. Some good has been thus accomplished; but now that local or numerical competition can be replaced by scientific and scholarly competition, to which the entire country and indeed the civilized world are parties, we begin to realize the waste and demoralization due to institutional competition. It is difficult to see how the state of Illinois, which in the interest of public health ought to be a factor in

medical education, can make an effective contribution thereto except by coöperation with the Chicago schools. Should the state seek to develop its own school in Chicago with the inevitable low tuition fees, great friction must result. Much preferable to conflict would be the withdrawal of the state from participation in clinical instruction altogether, content in that event with a half-school at Urbana, strengthened, be it hoped, by state laboratories of public health. The entire situation presents a rare opportunity for educational statesmanship.

INDIANA

Population, 2,808,115. Number of physicians, 5,086. Ratio, 1 : 558.
Number of medical schools, 2.

BLOOMINGTON-INDIANAPOLIS: (*Population:* Bloomington, 8,902; Indianapolis, 249,426).

(1) **INDIANA UNIVERSITY SCHOOL OF MEDICINE.** Started at Bloomington, 1903, it first gave two years' work at Bloomington, 1905, and the entire course at Indianapolis, 1909, through absorption of the local school. The double department is an organic part of the state university.

Entrance requirement: One year of college work.

Attendance: 266, 94 per cent from Indiana.

Teaching staff: 175, of whom 99 are professors. The laboratory branches at Bloomington are taught by full-time teachers, some of whom will for a while divide their time between Indianapolis and Bloomington. The Indianapolis teachers are otherwise all practitioners.

Resources available for maintenance: Both departments will be hereafter supported out of the general funds of the university, as the Bloomington department has hitherto been,—at a heavy loss, of course. Fees (amounting at Indianapolis and Bloomington together to \$31,240) are paid into the university treasury.

Laboratory facilities: At Bloomington separate laboratories with good equipment are provided for pathology and bacteriology, physiology and pharmacology, and anatomy,—the last-named strong in histology and neurology. Embryology is taught in the department of biology, physiological chemistry in the department of chemistry. Books and periodicals are accessible.

At Indianapolis the laboratories of the absorbed school were limited, but the university has already taken some steps to bring them up to the level of the Bloomington department.

Clinical facilities: Clinical instruction will be given at Indianapolis alone. The city dispensary is under control of the school faculty and has just been placed in charge

of a man of modern training. The attendance has been good. The City Hospital staff is appointed by the board of health on nomination of the university. The facilities are fair, but they have been used to little advantage in the past. There is no pavilion for contagious diseases.

Date of visit: December, 1909.

VALPARAISO: *Population, 6280.*

(2) **VALPARAISO UNIVERSITY.** This institution offers first two years at Valparaiso and all four in Chicago. (*See Chicago College of Medicine and Surgery.*) The two-year department was organized in 1901.

Entrance requirement: A high school course or its equivalent.

Attendance: 25.

Teaching staff: Two instructors conduct the classes in physiology, pathology, bacteriology, and anatomy, in the medical building. Chemistry, materia medica, and pharmacy are taught by men who give courses in these same branches to other students. The pathologist spends one-third of his time in the Chicago department.

Resources available for maintenance: Fees only.

Laboratory facilities: There is a simple but good equipment for teaching the necessary branches in an elementary form, pathology being perhaps the weakest by reason of the small amount of gross material available. The time of the teachers is consumed in routine work.

Date of visit: December, 1909.

General Considerations

THE situation in the state is, thanks to the intelligent attitude of the university, distinctly hopeful, though it will take time to work it out fully. The university has just secured complete control of the Indianapolis school. The state board has already come to its help by making the two-year college standard, in force at the university in 1910, the legal minimum for practice within the state. This places medical education in Indiana, as it already is in Minnesota, in the hands of the state university. The Bloomington department has been of such a character that it was easily possible to make it worthy of college-bred students, but the detachment of its teachers for regular service at Indianapolis should not long continue. While it is highly important that close relations be encouraged, it is necessary to accomplish this by progressively strengthening the Indianapolis end.

The Indianapolis school has been of the ordinary local type of the better sort. In order to make the school attractive to highly qualified students, it will be necessary (1) to employ full-time men in the work of the first two years, (2) to strengthen

the laboratory equipment, (3) greatly to improve the organization and conduct of the clinical courses. The trustees have formally committed themselves to this policy. It would appear necessary for some years to regard the needs of the Indianapolis department as a first lien on the increasing income of the university, if the university is to make good the ideals indicated by its entrance requirement. It can do Indiana no greater service in any direction. That done, Indiana will be one of the few states that have successfully solved the problem of medical education.

IOWA

Population, 2,192,608. Number of physicians, 3,624. Ratio, 1: 605.
Number of medical schools, 4.

DES MOINES: *Population*, 89,113.

(1) DRAKE UNIVERSITY COLLEGE OF MEDICINE. Organized in 1882 as an independent school, it became a university department in 1900.¹

Entrance requirement: A four-year high school education.

Attendance: 106.

Teaching staff: 16 professors and 29 of other grade; total, 45. There are no whole-time teachers. Student assistants are employed in the laboratories.

Resources available for maintenance: The school is practically dependent on its fees, the volume of which is not large,—for the funds of the university are too slender to permit any considerable allotment to the medical department. The total budget of the department was \$12,417, of which \$9505 came from student fees, \$1239 from interest.

Laboratory facilities: Modest laboratories, whose condition speaks well for the conscientiousness of those in charge, are provided for chemistry, anatomy, pathology, and bacteriology. The provision for physiology is somewhat more slender.

Clinical facilities: The school conducts clinics by courtesy at two hospitals, where instruction is given in a demonstrative way for some twelve to fifteen hours weekly. The opportunities are in every respect inadequate: the time is too short, the amount of material available too little, and the opportunities open to students too limited. A fair amount of obstetrical work is obtained.

The school owns and controls a small dispensary, fairly well equipped and painstakingly conducted.

Date of visit: April, 1909.

¹ As this report goes to press, it is announced that a fund of \$100,000 has been subscribed with which to improve this school.

(2) STILL COLLEGE OF OSTEOPATHY. Organized 1898. An independent school.

Entrance requirement: Less than a common school education.

Attendance: 115.

Teaching staff: 15, of whom 13 are professors.

Resources available for maintenance: Fees, amounting to \$17,250 (estimated).

Laboratory facilities: These are mainly limited to signs. "Anatomy" is painted prominently on a door which, on being opened, reveals an amphitheater; "Physiology" on a door which, on being opened, reveals a class-room with an almost empty bookcase, but no laboratory equipment; the key to "Histology" could not be found; "Chemistry" proved to be a disorderly elementary laboratory with some slight outfit for bacteriology besides. The dissecting-room was inadequate and disorderly.

Clinical facilities: The school makes no pretense of having hospital facilities. The catalogue states: "Cases"—pay cases of course—"needing hospital service are placed in the hospitals of the city,"—where the students cannot see them. The catalogue says of the infirmary: "The patient in no way comes in contact with the college clinic."

Everything about the school indicates that it is a business. One is therefore not surprised to find the following advertisement in the local newspaper: "Have your case diagnosed at Still College of Osteopathy, 1442 Locust Street." (Des Moines Register and Leader, Nov. 3, 1909.)

Date of visit: April, 1909.

IOWA CITY: Population, 9007.

(3) STATE UNIVERSITY OF IOWA COLLEGE OF MEDICINE. Organized 1869. An organic department of the state university.

Entrance requirement: One year of college work.

Attendance: 267, 87 per cent from Iowa.

Teaching staff: 32, of whom 12 are professors. The laboratory instructors devote full time to their work; the clinical teachers are practitioners, some of them non-resident: the professor of surgery resides at Sioux City, the professor of gynecology, who is likewise dean of the department, at Dubuque.

Resources available for maintenance: The department is supported by state appropriations. Its income from fees is \$13,707; its budget, \$35,216; the university hospital budget is \$33,745. Chemistry, general expense (light, heat, etc.), and a share of expense of general administration are not included in these figures.

Laboratory facilities: The equipment and instruction in the scientific branches are,

in general, good. This is particularly true of anatomy, which is admirably cared for. The departments of pathology and physiology lack a sufficient number of skilled assistants. An excellent museum and books are at hand.

Clinical facilities: The university hospital is, as it now stands, too small; the amount of material available in medicine, obstetrics, and contagious diseases has been very limited. An appropriation of \$75,000 has, however, been made for the purpose of increasing the hospital capacity. The methods of clinical teaching hitherto pursued have not been entirely modern, mainly for lack of proper organization and material. Supplementary clinical material is obtainable at the Sisters' Hospital and the Tuberculosis Sanitarium.

The dispensary is just in process of development. The dispensary clinic is so far largely limited to the eye, ear, nose, and throat.

Date of visit: November, 1909.

(4) STATE UNIVERSITY OF IOWA COLLEGE OF HOMEOPATHIC MEDICINE. Organized 1877.

An organic department of the state university.

Entrance requirement: A four-year high school education.

Attendance: 42, 83 per cent from Iowa.

Teaching staff: 10 professors and 15 of other grade. The professor of materia medica and therapeutics, who is likewise dean of the department, resides at Des Moines, the professor of theory and practice at Davenport.

Resources available for maintenance: The department is supported by state appropriations. Its income from fees is \$1864, its budget is \$5453, its hospital budget is \$7847. The school budget does not include expense incurred for laboratory instruction for a reason that the next paragraph will explain.

Laboratory facilities: Homeopathic students receive their laboratory instruction together with regular students of medicine, though there is now a difference of one year of college work and there will be next year a difference of two such years in their preparation, unless a resolution adopted by the board of education establishing the same basis of admission in the two departments becomes effective before that time.

Clinical facilities: The department possesses a hospital of 35 beds, quite inadequate to its purpose. The dispensary is correspondingly slender. Operating during part of last year, it received only 134 cases, of which 101 were diseases of the eye, ear, nose, and throat.

Date of visit: April, 1909.

General Considerations

IOWA is a state in which there are now between two and three times as many doctors as are really needed. The population of the state is increasing slowly, if at all. There

is, then, from the standpoint of the public interest no reason why a great number of physicians should be produced; there is no reason why any physician should be graduated unless his entrance into the profession will actually improve it. Further dilution would be unpardonable.

Of the four medical schools in the state none is at this time satisfactory. The osteopathic school at Des Moines is a disgrace to the state and should be summarily suppressed. In the absence of police power to terminate its career in this way, its graduates, undertaking as they do to treat all sorts of diseases, should be compelled to meet whatever standards are applied to other practitioners. The medical department of Drake University and the homeopathic department of the state university are well intentioned but feeble institutions that only a large outlay could convert into acceptable and efficient schools. Elevation of standards will probably embarrass rather than aid; for the urgent necessity of additional outlay will coincide with a decrease in the revenues on which Drake, at least, wholly depends. It would be the part of wisdom to retire from a contest to which the institution is clearly unequal; at any rate, it ought to be content to limit its endeavor to the work of the first two years.

The homeopathic department of the state university has now a small attendance on a relatively low entrance basis. As its students receive their scientific instruction with the classes now on a one-year, and hereafter to be on a two-year, college basis, it is clear that the entrance standard of the homeopathic department must be correspondingly elevated. The already slender enrolment is therefore destined still further to shrink. For so small a body of students the state is not likely to provide increased clinical facilities and a resident faculty of its own. Wisdom would therefore counsel the adoption in Iowa of the Minnesota plan: the two medical departments of the state university should be consolidated, with a provision for special teaching in *materia medica* and therapeutics for students who desire the homeopathic diploma.

The two university hospitals could thus be added together; the smaller would perhaps be devoted to obstetrics; the larger, with the additional wing now to be added, would provide comfortably for general medical and surgical clinics. The creation of a strong resident faculty, and the adoption of a liberal and enlightened policy in dealing with the sick poor of the state, would place Iowa City in position to duplicate the honorable record which the University of Michigan has, under similar circumstances, made at Ann Arbor.

KANSAS

Population, 1,663,438. Number of physicians, 2650. Ratio, 1: 628.

Number of medical schools, 3.

LAWRENCE-ROSEDALE: (*Population*: Lawrence, 13,678; Rosedale, 3270—suburb of the two Kansas Cities, population, 286,074).

(1) **UNIVERSITY OF KANSAS SCHOOL OF MEDICINE.** The Scientific Department, at Lawrence, was organized in 1899; the Clinical Department, at Rosedale, was organized by merger with a local school in 1905.

Entrance requirement: Two years of college work.

Attendance: 89, 79 from Kansas, 8 from Missouri.

Teaching staff: At Lawrence, anatomy, physiology, and bacteriology are taught by teachers whose instruction is confined to medical students; but the professor of anatomy is also professor of gynecology at Rosedale and practises his specialty. The pathologist is expected to eke out his income by outside work. Physiology, chemistry, and pharmacy are taught in general laboratories devoted to those subjects. The medical classes are not always separate.

At Rosedale there is a teaching staff of 68, of whom 24 are professors. Two of them devote their whole time to teaching pathology, bacteriology, and clinical pathology. A third, the dean of this end, likewise gives his entire time to the school and hospital.

Resources available for maintenance: The medical school shares in the general funds of the university. The budget for the current year is about \$17,000 for the Scientific Department, and \$23,000 for the Clinical Department. Income in fees, \$5080.

Laboratory facilities: The laboratories for anatomy, chemistry, and physiology are good and in active operation. Pathology and bacteriology are, so far, less highly developed. Books and current scientific periodicals are accessible.

Clinical facilities: The Clinical Department has a small hospital of 35 beds, not used, however, to the best advantage, partly because the faculty is not composed of men whose training has been modern, partly because, being practitioners, they cannot devote time enough to teaching. The school enjoys additional privileges of the usual kind at a Catholic hospital in Kansas City, Kansas, and at the City Hospital in Kansas City, Missouri. The obstetrical work is mainly out-patient; contagious diseases are rarely seen. On the whole, far too little clinical material under proper control is offered. An excellent building, well equipped, devoted to pathology, clinical pathology, and bacteriology, adjoins the university hospital. It contains a few books and some current periodicals.

Two dispensaries are available, one at the Rosedale building, not used for teaching until this year; the other, the so-called North End Dispensary, where a fair amount of material has hitherto been handled in an incredibly slipshod manner.

Each of the two parts of the university school of medicine has its own dean; for all practical purposes, the university conducts two half-schools.

Date of visit: November, 1909.

(2) **WESTERN ECLECTIC COLLEGE OF MEDICINE AND SURGERY.** Organized 1898. A stock company.

Entrance requirement: Nominal.

Attendance: 21.

Teaching staff: 32, of whom 30 are professors, 2 of other grade.

Resources available for maintenance: Fees, amounting to perhaps \$1600 this year.

Laboratory facilities: These comprise a few small, indescribably dirty and disorderly rooms, containing three microscopes, a small amount of physiological apparatus, some bacteriological stains, a few filthy specimens, and meager equipment for elementary chemistry, but no running water. All laboratory work is conducted by one teacher, who serves in the same capacity in the local osteopathic and homeopathic schools and does commercial work besides. No anatomy was going on at the time of the visit, as dissection runs only from January 3 to March 12.

Clinical facilities: Practically none. A wretched room is called the "Dispensary," and an attendance of "about three a day" is claimed; it is hoped that this "can be worked up to six a day." The catalogue states that "clinics are held weekly at the Kansas City, Missouri, General Hospital," but the statement is denied by the superintendent of the hospital.

Date of visit: November, 1909.

TOPEKA: *Population,* 45,143.

(3) **KANSAS MEDICAL COLLEGE.** Established 1890. Since 1902 the medical department of Washburn College, which teaches chemistry to the medical students, but is without control of appointments in the medical faculty.

Entrance requirement: A four-year high school course or its equivalent.

Attendance: 65, 92 per cent from Kansas.

Teaching staff: 47, 31 being professors. There are no instructors giving their whole time to the school, except in so far as chemistry, above mentioned, is concerned.

Resources available for maintenance: Practically only fees, amounting to \$4876 a year.

Laboratory facilities: The school occupies a three-story building, on the upper floors of which there have been improvised laboratories for pathology and bacteriology. They contain the necessary equipment for routine teaching, but are poorly kept. There is a small amount of apparatus for physiological demonstrations. The dissecting-room is indescribably filthy; it contained, in addition to necessary tables, a single, badly hacked cadaver, and was simultaneously used as a chicken yard.¹ There is no museum, only a few old books, some charts, a few models, etc.

¹ This is explained as follows: "It had not been in use for eight months or so and would not be in use

Clinical facilities: A total of eleven hours a week of clinical instruction, only nine of which can be attended by any one student, is offered at four different hospitals. The opportunities, limited as they are, are largely surgical. The feeling towards the school is unusually cordial, but the hospitals lack the necessary equipment and organization for effective teaching.

At the time the school was visited a small room was used for a dispensary; the attendance was slight; there was no equipment at all. Recently larger quarters have been provided.

Date of visit: November, 1909.

General Considerations

RECENT action making a year of college work the minimum preliminary to practice in Kansas will wipe out the eclectic school at Kansas City and the Topeka school, both of which would, however, die out even on the present standard. The future of medical education in the state, therefore, very properly lies with the state university. This institution has shown the desire to provide instruction of high grade by raising its entrance requirements until they now call for two years of college work; but it did not realize that it was incumbent upon it to improve facilities and instruction at the same time. Great efforts must therefore be made to hasten their development, for the higher entrance requirement is already in force. The school is now a divided school. It would be a simple matter to develop the laboratory end at Lawrence; it will be difficult and expensive to develop the clinical end at Rosedale correspondingly; and still more difficult, to establish effective coöperation between the severed halves of the department. The needs of a university medical department are so great that the university will find it necessary to refrain from many other projects, pending the upbuilding of a creditable school of medicine. It is therefore unfortunate that the educational funds of the state have been already to some extent needlessly consumed in the duplication of engineering and normal departments within the several state institutions. No comprehensive and well coördinated scheme of state educational development has been worked out. It would seem essential in the first place to demarcate the respective provinces of the several state institutions, so that each would care for certain interests without trespassing on the ground reserved to the others. That done, medicine would fall to the state university and would include a public health laboratory. Certain fundamental questions respecting the location, organization, and general scope of the entire department would next require to be settled. Thereafter, the plan adopted could be realized unit by unit, year by year.

until cold weather. [It was then the middle of November.] The cadaver happened to be there because of the private studies of one of the professors, who put it there for his own convenience. In the same way, because the room was not in public use and would not be for some time, another member of the faculty stored there, for use in embryology, the coop of live chickens."

KENTUCKY

Population, 2,406,859. Number of physicians, 3708. Ratio, 1 : 649.
Number of medical schools, 3.

LOUISVILLE: *Population, 240,160.*

- (1) UNIVERSITY OF LOUISVILLE MEDICAL DEPARTMENT. Organized 1837, it has recently absorbed four other schools. Until lately the university was limited to loosely aggregated schools of law and medicine; latterly an academic department without endowment has been started.

Entrance requirement: Less than a high school education. Examples were found of students admitted from two-year high schools or less.

Attendance: 600.

Teaching staff: 90, of whom 40 are professors. The distribution of the chairs is significant: the major medical staff contains twelve names, six of them professors; surgery, twelve names, all professors. The laboratory branches are in marked contrast: two names make the major staff in physiology, one in chemistry, one in pathology and bacteriology. There are four whole-time professors of modern training in the scientific departments. Assistants, some of them also giving entire time to the school, are provided.

Resources available for maintenance: Fees, amounting to \$75,125.

Laboratory facilities: Teaching laboratories are provided for chemistry, pathology, bacteriology, physiology, and pharmacy. They are inadequate in appointments and teaching force for the thorough teaching of the fundamental sciences to so large a student body. A separate building has just been set apart for anatomy, operative surgery, and the city morgue.

Clinical facilities: The school has a hospital of 50 beds, with an average of 30 patients, two-thirds of the cases being surgical, and not all available for teaching. Obstetrical cases are rare, but there is an out-patient obstetrical service. At the City Hospital eight amphitheater clinics are held weekly for classes containing from 100 to 300 students. There are no regular ward classes. The obstetrical ward is not open to students; there is no pavilion for contagious diseases. The hospital facilities are therefore poor in respect to both quality and extent: unequal to the fair teaching of an even smaller body of students, they are made to suffice for the largest school in the country.

The school dispensary has an average daily attendance of over one hundred. It is regularly used for teaching on the section method.

Date of visit: December, 1909.

(2) **SOUTHWESTERN HOMEOPATHIC MEDICAL COLLEGE.** Organized 1892. An independent school.

Entrance requirement: The same as that of the University of Louisville Medical Department.

Attendance: 13.

Teaching staff: 27, 12 being professors.

Resources available for maintenance: Fees, amounting to \$1100.

Laboratory facilities: There is no outfit worth speaking of in any department; the building is wretchedly dirty, especially the room said to be used for anatomy. There is nothing to indicate recent dissecting.

Clinical facilities: The school gets one-fifth of the patients admitted to the City Hospital and can use them for demonstrative purposes. There is no organized dispensary.

Date of visit: January, 1909.

(3) **LOUISVILLE NATIONAL MEDICAL COLLEGE (Colored).** An independent school, organized 1888, now affiliated with the colored State University.

Entrance requirement: Less than high school education.

Attendance: 40.

Teaching staff: 23, of whom 17 are professors.

Resources available for maintenance: Fees, amounting to \$2560.

Laboratory facilities: Nominal.

Clinical facilities: A small and scrupulously clean hospital of 8 beds is connected with the school.

Date of visit: January, 1909.

General Considerations

THE situation in Kentucky is a simple one. The homeopathic school is without merit. Its graduates deserve no recognition whatsoever, for it lacks the most elementary teaching facilities. The University of Louisville has a large, scattered plant, unequal to the strain which numbers put upon it. In the old days, Louisville, with a half-dozen "regular" schools, was a popular medical center, to which crude boys thronged from the plantations. The schools offered little beyond didactic teaching. Now, they have been arithmetically added together; the resulting school is indeed superior on the laboratory side to any of its component parts; but there are radical defects for which there is no cure in sight. The classes are unmanageably huge; the laboratories overcrowded and undermanned; clinical facilities, meager at best, broken into bits in order to be distributed among the aggregated faculty. To carry the school at all,

a large attendance is necessary; but a large attendance implies a low standard. The situation is thus practically deadlocked.

The outlook is not promising; for there is no indication of such support, financial or academic, as would be required in order to reconstruct the institution on acceptable lines. Elsewhere a strong college or university has been in reach: as, for example, across the Ohio, Indiana University has just now put its hand to the plow and will not turn back. But in Kentucky the state university is totally unequal to the task. It labors under the initial disadvantage of being situated in another town,—not the less a disadvantage because capable of being overcome; more serious, however, is its educational ineptitude. It has never been an active educational factor, and having now chosen a politician, without educational qualification or experience, as its president, its immediate future promises little. From the existing so-called academic department of the University of Louisville neither aid nor ideals can come. It is quite without resources. We have indeed progressed too far in our social and educational development to use the word “university” for an enterprise of this kind. Classes in literature, languages, and elementary science may indeed be organized by volunteer teachers, in hours left open by their regular engagements, or by instructors supported from year to year by subscription; they may discharge a highly useful office in any community, but they ought to be called by their right name. An academic department of a university they are not: why should they not be described as a people’s institute, or by some other designation calculated to indicate their actual character?¹ The loose use of the words “college” and “university” prolongs educational chaos; it hinders the apprehension of genuine and fundamental educational distinctions. Assuredly, an institute of the type described cannot dominate or transform a hitherto independent group of medical schools.

LOUISIANA

Population, 1,618,358. Number of physicians, 1798. Ratio, 1 : 900.

Number of medical schools, 2.

NEW ORLEANS: *Population*, 332,169.

(1) MEDICAL DEPARTMENT OF THE TULANE UNIVERSITY OF LOUISIANA. Organized in 1834, the school affiliated with the University of Louisiana in 1845, and with Tulane in 1884, at which date the University of Louisiana became Tulane University. In 1902 it assumed its present status as an organic part of the university.

Entrance requirement: A four-year high school education or its equivalent, administered by the academic authorities. The actual standard is somewhat below the nominal standard, though gradually rising towards it.

¹ These comments apply with equal force to Toledo.

Attendance: 489.

Teaching staff: 75, of whom 17 are professors. The laboratory branches are in charge of five men, who give their entire time to teaching and investigation.

Resources available for maintenance: Endowment funds, aggregating about \$900,000, yield an income of \$26,000 annually; fees amount to \$67,500. The budget of the department amounts to \$101,781.

Laboratory facilities: New and excellent laboratories are provided for the work of the first and second years. The professors in charge represent modern ideals, and are enthusiastically engaged in reconstructing the entire school on progressive lines. The anatomical museum is one of the best in the country. The library is small.

Clinical facilities: The school enjoys unusual privileges and opportunities in the Charity Hospital, an institution of 1050 beds. Recently an additional ward for surgery and gynecology has been added, full control of the services being vested in the Tulane faculty by the terms of the gift. The abundant material is freely used by the medical faculty, though certain defects of organization, equipment, and relationship must be corrected in order to render the situation ideal. The main point, however, is secure, for the position of the medical school in the hospital is ensured through legislative enactment. The professorship in medicine has recently been filled by importation without any friction whatsoever.

The dispensary service is adequate.

Postgraduate instruction in specialties is offered by the New Orleans Polyclinic, affiliated with the Tulane University.

(2) FLINT MEDICAL COLLEGE (Colored). Organized in 1889, it is a department of New Orleans University, which is managed by the Freedman's Aid Society of the Methodist Episcopal Church, North.

Attendance: 24.

Teaching staff: 15, of whom 6 are professors. All are practitioners.

Resources available for maintenance: Tuition fees, \$1300 (estimated), and small appropriations voted by the Freedman's Aid Society constitute the income. The entire budget, including that of the hospital adjoining, is less than \$10,000 annually.

Laboratory facilities: There is scant equipment in anatomy, chemistry, pathology, and bacteriology. The rooms are in poor condition.

Clinical facilities: The school controls a hospital of 20 beds, with an average of 17 patients monthly, and a dispensary with an average daily attendance of one or two.

Date of visit: January, 1909.

General Considerations

THE medical department of Tulane University is one of a very few existing southern schools that deserve development. The south is in general overcrowded with schools with which nothing can be done; for they are conducted by old-time practitioners, who could not use improved teaching facilities if they were provided. The case is different at Tulane. Its recent reorganization has put imported men of modern training and ideals in charge of the most important departments, laboratory and clinical. There is no question that if properly supported, they will quickly bring the institution to a position of commanding influence. To achieve this result, the school must be freed of the necessity of so largely relying upon fees for its support. For once rendered by endowment comparatively independent, it can use its superior opportunities as a lever to brace up the general educational situation of the southern states. It could compel those seeking these opportunities to improve their preparation at least to the full limit of local possibilities. The urgent need of the south is an object lesson in medical education, such as will prominently embody what is sound and desirable; and such an object lesson the medical department of Tulane could readily be made: it possesses already the laboratories and the hospital; it requires only the means that will enable it to utilize them fully.

Flint Medical College is a hopeless affair, on which money and energy alike are wasted. The urgent need in respect to the medical education of the negro is concentration of resources slender at best on a single southern institution. Much the most favorably situated for this purpose is Meharry Medical College at Nashville.

MAINE

Population, 724,508. Number of physicians, 1198. Ratio, 1: 600.

Number of medical schools, 1.

BRUNSWICK-PORTLAND: (*Population*:¹ Brunswick, 2321; Portland, 58,512).

MEDICAL SCHOOL OF MAINE. Organized 1820. A divided school, being the medical department of Bowdoin College.

Entrance requirement: Four-year high school diploma or equivalent, ascertained by examination, conducted, however, under the auspices of the medical school, not by Bowdoin College, and below the college standard. Certificates are accepted far below standard in value.

Attendance: 81, 86 per cent from Maine.

Teaching staff: 35, 14 being professors, 21 of other grade.

¹Census Bureau without data.

Resources available for maintenance: From endowment, \$7600; from fees, \$8100; total, \$15,700.

Laboratory facilities: The laboratory branches are taught in the medical school building at Brunswick with the exception of chemistry, which is well provided for in the college laboratories; the equipment covering physiology, bacteriology, and pathology is slender. There is nothing in pharmacology at all. There are no whole-time teachers in the scientific branches. The professor of anatomy is non-resident; his main duty is lecturing, the dissecting-room being supervised by recent graduates, engaged in practice. "The professor looks in occasionally." The professor of pathology is physical director of Bowdoin College. The professor of physiology is non-resident.

Clinical facilities: Clinical instruction is given at Portland by teachers who have little commerce with the laboratories at Brunswick. The chief clinical reliance of the school is the Maine General Hospital, where instruction is given principally in the amphitheater, as a majority of the cases are surgical. Obstetrical work is not to be counted on. Internes do the clinical laboratory work and make up case histories. The records are indexed only by name of the patient. Additional clinical material is obtained at the Eye and Ear Infirmary, Children's Hospital, etc.

Students spend also a small amount of time at a thoroughly wretched city dispensary, where the cases are few, where no records are kept, and where not even copies of prescriptions are filed. The dispensary does not own a microscope.

A course in clinical microscopy is given at the college building in Portland. "Urine and sputum are gathered, and students are told about the cases from which they come." Neither end of this school meets the requirements for the teaching of modern medicine.

Date of visit: October, 1909.

[For general discussion see "New England," p. 361.]

MARYLAND

Population, 1,319,132. Number of physicians, 2012. Ratio, 1: 658.

Number of medical schools, 7.

BALTIMORE: *Population*, 588,475.

(1) MEDICAL DEPARTMENT OF THE JOHNS HOPKINS UNIVERSITY. Established 1893. An organic university department.

Entrance requirement: The bachelor's degree, representing specific attainments in chemistry, physics, biology, German, and French.

Attendance: 297.

Teaching staff: 112, of whom 23 are professors. All the laboratory teaching is conducted by instructors who give their entire time to teaching and research; the heads

of the clinical departments are salaried teachers attached to the Johns Hopkins Hospital.

Resources available for maintenance: The income from tuition fees is \$60,542, that from endowments \$19,687, making a total of \$80,229. The budget calls for \$102,429, not including salaries of the clinical faculty and other items carried by the Johns Hopkins Hospital, which is thus actually an integral part of the medical school. The productive hospital endowments now aggregate \$3,632,289, not including the bequests for the Phipps Psychiatric Clinic and the Harriet Lane Johnson Home for Children.

Laboratory facilities: These facilities are in every respect unexcelled. As the institution has been from the beginning on a graduate basis, teaching and research have been always equally prominent in its activities.

Clinical facilities: The Johns Hopkins Hospital and Dispensary provide practically ideal opportunities. The medical staff of the hospital and the clinical faculty of the medical school are identical; the scientific laboratories ranged around the hospital are in close touch with clinical problems, immediate and investigative. The medical school plant is thus an organic whole, in which laboratories and clinics are inextricably interwoven. Recent foundations have greatly augmented the original hospital plant in the direction of psychiatry, pediatrics, and tuberculosis. Three hundred and eighty-five beds under complete control are now available.

The dispensary is largely attended, and is admirably conducted from the standpoint of both public service and pedagogic efficiency.

Date of visit: December, 1909.

(2) COLLEGE OF PHYSICIANS AND SURGEONS. Established 1872. An independent institution.

Entrance requirement: Less than a high school education.

Attendance: 252.

Teaching staff: 59, of whom 21 are professors, 38 of other grade. One teacher devotes his entire time to medical instruction.

Resources available for maintenance: Fees, amounting to \$39,000.

Laboratory facilities: Ordinary working laboratories are provided for bacteriology, histology, and pathology, including surgical pathology; the chemical laboratory provides satisfactorily for general chemistry. The dissecting-room is fair, as far as it goes. There is no experimental pharmacology and no student work in experimental physiology. The museum consists of several hundred specimens; the library, of which there is a librarian in charge, of perhaps 1500 volumes and a few current periodicals. The undeveloped character of the laboratories is due, (1) to the pay-

ment of faculty dividends; (2) to the application of current fee income to the discharge of building debts.

Clinical facilities: The school completely controls the adjoining hospital, of which some 210 beds, including a maternity ward, are available for teaching. Ward-teaching on the section plan is in use. The clinical laboratory is open to the students.

The dispensary occupies an excellent suite of rooms; the attendance is ample.

Date of visit: March, 1909.

(3) UNIVERSITY OF MARYLAND SCHOOL OF MEDICINE. Organized 1807. Essentially an independent institution with a university charter, though nominally the medical department of St. John's College (Annapolis).

Entrance requirement: Less than a high school education.

Attendance: 316.

Teaching staff: 61, of whom 24 are professors, 37 of other grade.

Resources available for maintenance: Fees, amounting to \$44,530 (estimated), out of which dividends are paid to the faculty and a large mortgage debt carried.

Laboratory facilities: Good undergraduate laboratories adequate to routine teaching are provided in two poorly kept buildings for the following subjects: chemistry, physiology, including physiological chemistry and histology, pathology and bacteriology. Anatomy is poor. There is a small museum. In a separate building is a large and interesting library, but it is open only two hours each day.

Clinical facilities: The school controls its own hospital, opposite the laboratory buildings, about 140 beds being available for teaching. The hospital records are well kept, senior students who pay for the privilege serving as clinical assistants. A separate maternity ward furnishes obstetrical work in abundance.

The dispensary is large, properly equipped, and well kept.

Date of visit: March, 1909.

(4) BALTIMORE MEDICAL COLLEGE. Organized 1881. An independent institution.

Entrance requirement: Much less than a four-year high school education. Advanced standing is freely granted to failed students dropped from other schools.

Attendance: 392.

Teaching staff: 63, of whom 20 are professors, 43 of other grade. There are no teachers giving entire time to medical instruction.

Resources available for maintenance: Fees, amounting to \$33,424.

Laboratory facilities: The school possesses a new and very attractive laboratory

building. It is well equipped for undergraduate instruction in chemistry and pathology; inadequately for physiology and bacteriology. A large room with ample material provides for dissecting.

Clinical facilities: The school has the use of about 122 beds in a hospital which it built and has leased to the Sisters of Charity; it has access to several other institutions besides.

A suite of poorly kept rooms is set aside for a dispensary. The attendance is ample.

Date of visit: March, 1909.

(5) WOMAN'S MEDICAL COLLEGE OF BALTIMORE. Organized 1882. An independent institution.

Entrance requirement: Less than a high school education.

Attendance: 22.

Teaching staff: 31, of whom 18 are professors, 13 of other grade.

Resources available for maintenance: Fees, amounting to \$2000.

Laboratory facilities: Small laboratories, scrupulously well kept, show a desire to do the best possible with meager resources: pathology, bacteriology, embryology, chemistry, and anatomy are thus taught.

Clinical facilities: These are quite insufficient: across the street from the school is a hospital with 17 beds; supplementary material is obtained at several institutions through staff connections.

A suite of rooms in the college building is devoted to dispensary purposes. There is a fair attendance.

Date of visit: March, 1909.

(6) MARYLAND MEDICAL COLLEGE. Organized 1898. An independent institution.

Entrance requirement: Nominal.

Attendance: 95. Almost one-half the school is in the senior class.

Teaching staff: 39, of whom 21 are professors, 18 of other grade.

Resources available for maintenance: Fees, amounting to \$7460 (estimated).

Laboratory facilities: The school building is wretchedly dirty. Its so-called laboratories are of the worst existing type: one neglected and filthy room is set aside for bacteriology, pathology, and histology: a few dirty test-tubes stand around in pans and old cigar-boxes. The chemical laboratory is perhaps equal to the teaching of elementary chemistry. The dissecting-room is foul. This description completely exhausts its teaching facilities. There is no museum or library and no teaching accessories of any sort whatsoever.

Clinical facilities: The college faculty own and conduct a hospital within a few blocks. It is essentially a private institution, of no great value to students. Less than 50 beds are free.

The dispensary claims a fair attendance.

Date of visit: March, 1909.

(7) ATLANTIC MEDICAL COLLEGE. Organized 1891 as an independent homeopathic institution. Having "passed through many vicissitudes," it is now non-sectarian.

Entrance requirement: Nominal.

Attendance: 48, of whom 31 are in the senior class, 1 in the freshman class. Of 21 graduates, class of 1908, almost all had failed at other schools or before the regular state board before entering the Atlantic Medical College, on graduation from which they could appear before the Homeopathic State Board of Maryland, "reputed to be a much easier board to pass."

Teaching staff: 47, of whom 12 are professors, 35 of other grade. Two members of the teaching staff were graduated in the class of 1908, above mentioned, after having failed before the regular state board; a third instructor, also a graduate of 1908, entered this school after failure at the local College of Physicians and Surgeons.

Resources available for maintenance: Fees, amounting to \$3905 (estimated).

Laboratory facilities: The school occupies a filthy building, in which are to be found an elementary chemical laboratory, a small room assigned to pathology, bacteriology, and histology, equipment being scant and dirty, an ordinary dissecting-room, a lecture-room with half a skeleton, a small amount of imperfect physiological apparatus with a few frogs, and a few cases of books, mostly old and useless.

Clinical facilities: These are claimed at a small private hospital several miles off. They can at best be hardly more than nominal.

The basement of the college building is used for a dispensary.

Date of visit: March, 1909.

General Considerations

THERE are seven medical schools in Maryland, a state whose population increases slowly and in which there are between two and three times as many physicians as it now requires. Of these seven schools, two belong to the worst type of American medical school, viz., the Atlantic Medical College and the Maryland Medical College. That such unconscionable concerns should at this day continue to flourish is a blot upon the state of Maryland and the city of Baltimore.

Two more of the seven schools, the Baltimore Medical College and the Woman's

Medical College, are weak; two others, the College of Physicians and Surgeons and the University of Maryland, are large commercial enterprises, whose financial responsibilities are far too extensive for their capital or fee income; the sums annually applicable to debts in order to simplify their position, or to maintenance in order to improve their teaching, are reduced by the payment of substantial dividends to practitioner teachers. Education is thus overshadowed by business. Entrance standards are low, the full-time teacher is practically unknown, the laboratories are slovenly, the atmosphere depressing.

Like Pennsylvania, Maryland has granted lump sums to private corporations engaged in charitable work. The larger ones of the six medical schools mentioned have thus combined to obtain from the state money enough to build and partly to support their hospitals. Should the state ever conduct its philanthropic business intelligently, these irresponsible methods would stop; and with them, the medical schools which they have helped to float. The Johns Hopkins Medical School, for which neither the state of Maryland nor the city of Baltimore has ever done anything, is thus the only medical school in Maryland that either ought to or can live, and to its development greatly increased means should be freely devoted.

If, meanwhile, a combination of the better independent schools of Baltimore were effected, much of their property could be disposed of, the equity being used to equip the resulting institution. A single independent school might thus have a brief and not discreditable career. In the end, however, the independent schools will pass away, in Maryland as elsewhere. To their present hospitals the Johns Hopkins would become the heir, thus greatly strengthening its clinical resources. At this date the Johns Hopkins University is the only academic institution in the state capable of conducting a modern medical school. It would be safe, interesting, and instructive to leave medical education in Maryland for a decade or two wholly in its hands. The state will not meanwhile lack for doctors; it is already overcrowded.

The prerequisite to any reconstruction of the Baltimore situation is the revision of the state law. The country affords no more conclusive proof of the viciousness of the two-board system. Not only is neither state board empowered to enforce a preliminary educational requirement, but candidates refused by the "regular" board subsequently succeed before the homeopathic board. This underground traffic is responsible for the existence of the Atlantic Medical College, a homeopathic school that has rendered itself an attractive haven of refuge to rejected "regular" students by dropping the significant word from its title.

MASSACHUSETTS

Population, 3,162,347. Number of physicians, 5,577. Ratio, 1 : 567.

Number of medical schools, 5.

BOSTON : *Population*, 629,868.

(1) **MEDICAL SCHOOL OF HARVARD UNIVERSITY.** Organized 1782. An integral department of Harvard University.

Entrance requirement : The student has a choice between the bachelor's degree or certain definite requirements in science and modern languages representing two years of undergraduate work, provided that in the latter case a higher passing mark is required for graduation. In the present year, out of a first-year class of 62, 60 entered with the bachelor's degree.

Attendance : The total enrolment is 285 ; about 69 per cent from New England, 53 per cent from Massachusetts.

Teaching staff : 173, of whom 23 are professors ; laboratory instructors as a rule devote their entire time to the department.

Resources available for maintenance : The department has an endowment of \$3,326,961 ; the fees are merged in the general income of the school. The annual budget is \$251,889, of which \$72,037 are derived from tuition fees.

Laboratory facilities : The laboratories are unexcelled in equipment and organization, in respect to both teaching and research.

Clinical facilities : Abundant clinical material is available at the Massachusetts General Hospital, the City Hospital, and elsewhere. But serious restrictions are felt in two directions : (1) While the university is free to secure laboratory men wherever it chooses, it is practically bound to make clinical appointments by seniority, in accordance with the custom prevailing in the hospital which it uses, or to leave its professor without a hospital clinic. In general it follows that the heir to the hospital service is heir to the university chair. In consequence there is a noticeable lack of sympathy between the laboratory and the clinical men. They do not represent the same ideals. There is no question but that an institution of this rank ought to work in the most intimate coöperation with a hospital ; and that, if such were the case, the same principles would obtain in selecting clinical teachers as prevail elsewhere in the university. (2) The extent to which hospital material can be utilized is also limited, though less in surgery than in medicine. The teaching is in the main of the demonstrative character. Something more intimate is possible in a limited way with fourth-year students. The hospital services with one exception rotate at the end of periods of four months.

The school is now installing its own dispensary, likely to be of great value in its clinical instruction.

Date of visit : October, 1909.

(2) **TUFTS COLLEGE MEDICAL SCHOOL.** Organized 1893. Administratively an integral department of Tufts College, though actual scientific intercourse is not intimate.

Entrance requirement: Below an actual four-year high school course, since certificates of uncertain value have been accepted and examinations used cover less than half a high school course. This is the less defensible as 97 percent of the total enrolment come from New England.

Attendance: The attendance is 384; 97 per cent from New England, 80 per cent from Massachusetts.

Teaching staff: 103, of whom 33 are professors. There are five full-time professors and five full-time assistants in pathology, histology, physiology, and chemistry.

Resources available for maintenance: The school relies on its fees, amounting to \$59,093, repaying out of them large advances for buildings made out of the general income of the college.

Laboratory facilities: The laboratories are entirely adequate to the teaching work of the school.

Clinical facilities: For medical clinics the school is confined to the Boston City Hospital and the Boston Dispensary, which furnish abundant material under the usual more or less imperfect control. The Carney Hospital provides considerable additional work in surgery; the specialties are cared for in other institutions. The school is thus clinically handicapped in exactly the same way as Harvard, but to a greater degree by reason of its being restricted in its medical clinics to a single municipal hospital and dispensary. Its range of choice in the matter of clinical professors is limited by the same considerations.

Date of visit: October, 1909.

(8) BOSTON UNIVERSITY SCHOOL OF MEDICINE. Homeopathic. Organized 1873. The University connection is nominal.

Entrance requirement: A certificate of graduation from an approved four-year high school, or examination; the examination is not set by the university, but by the medical school, and is markedly below the four-year high school standard.

Attendance: Total enrolment, 90; 83 per cent from New England, about 60 per cent from Massachusetts.

Teaching staff: 64, 29 being professors.

Resources available for maintenance: The institution is mainly dependent on fees (\$12,762, estimated), but these have been consistently used to develop its facilities.

Laboratory facilities: In striking contrast with schools in which, whatever the claim, fees have not been so used, this school has an excellent building, admirably kept and well equipped, and attractive laboratories for pathology, bacteriology, physiology, chemistry, and anatomy. There is no experimental pharmacology. It possesses a library in charge of a permanent librarian, a beautifully mounted collection

of pathological material, an excellent refrigerator plant, and other features indicative of intelligent and conscientious effort.

Clinical facilities: The school adjoins a hospital of some 280 beds, of which 125 are available for amphitheater and ward clinics. The material is fairly abundant and varied; but students do not make laboratory examinations for the patients whom they see in the wards. A pavilion for contagious diseases is also accessible. Connected with the hospital is a large, thoroughly modern, and systematically conducted dispensary, in which laboratory work and physical examination are more closely connected.

Date of visit: October, 1909.

(4) COLLEGE OF PHYSICIANS AND SURGEONS. Organized 1882. An independent institution.

Entrance requirement: Vague.

Attendance: 172, called in the catalogue "matriculates and applicants."

Teaching staff: 30 professors and 15 lecturers.

Resources available for maintenance: Fees, amounting to \$10,000 (estimated). A reduction of 20 per cent is made to students who pay in advance for the entire four years.

Laboratory facilities: These facilities are wretched: ill-lighted, dirty, and poorly equipped so-called laboratories are provided for anatomy, pathology, etc.

Clinical facilities: The clinical resources are dubious. The catalogue attempts to convey the idea (p. 21) that the school has the same opportunities as Harvard and Tufts; as a matter of fact, no member of the faculty of the College of Physicians and Surgeons has a staff appointment in the City Hospital, and teaching there is utterly impossible otherwise. The same is true of the wards of the Massachusetts General Hospital. At both institutions anyone, whether a student or not, may attend the public amphitheater clinics once weekly. But as these are freely open to the public and are of little or no value, they are hardly to be counted as teaching facilities. A limited attendance is required at a miserable dispensary, more than an hour's journey from the college building.

Date of visit: October, 1909.

CAMBRIDGE: Population, 102,982.

(5) MASSACHUSETTS COLLEGE OF OSTEOPATHY. Established 1897. An independent institution.

Entrance requirement: Vague.

Attendance: 90.

Teaching staff: 34, of whom 19 are professors.

Resources available for maintenance: Fees, amounting to \$11,400 (estimated).

Laboratory facilities: The school occupies a neatly kept building, in which are provided one poorly equipped laboratory in common for pathology and bacteriology, and another, similar in character, for chemistry and urinalysis, and an anatomical room. It possesses neither museum nor library. Instruction at the school building is limited to lectures, recitations, and "laboratory" work.

Clinical facilities: No "treatment" is administered in the school building. For that the students resort in their last year to the Chelsea Hospital, a pay institution of 10 to 15 beds, more than one hour's journey from the college building. Pathology is taught in the same year.

Date of visit: October, 1909.

[For general discussion see "New England," p. 261.]

MICHIGAN

Population, 2,666,808. Number of physicians, 4109. Ratio, 1: 649.

Number of medical colleges, 5.

ANN ARBOR: *Population*, 14,734.

(1) UNIVERSITY OF MICHIGAN DEPARTMENT OF MEDICINE AND SURGERY. Organized in 1850. An integral part of the university.

Entrance requirement: Two years of college work, including sciences strictly enforced.

Attendance: 389, 45 per cent from Michigan.

Teaching staff: 63, of whom 22 are professors. The laboratory work is wholly in charge of full-time instructors; but assistants in adequate number are lacking. The clinical teachers are salaried and owe their first duty to the school.

Resources available for maintenance: The school and the university hospital are supported mainly by state appropriation. The budget of the school is \$88,000, that of the hospital, \$70,000. Endowments to the extent of \$175,000 carry a part of this charge. The income in fees is \$34,093.¹

Laboratory facilities: Excellently equipped laboratories are provided for all the fundamental branches; the men in charge are productive scientists as well as competent teachers. There is a large library, a good museum, and other necessary teaching aids.

Clinical facilities: The school is fortunate in the possession of its own hospital, every

¹ Including laboratory fees paid by students registered in the homeopathic department; see (9).

case in which can be used for purposes of instruction. A liberal policy has largely overcome the disadvantages of location in a small town; for the clinical material is in the departments of surgery, psychiatry, and various specialties, of sufficient amount; it is fair in medicine, increasing in obstetrics. The thoroughness and continuity with which the cases can be used to train the student in the technique of modern methods go far to offset defects due to limitations in their number and variety.

Date of visit: March, 1909.

(2) UNIVERSITY OF MICHIGAN HOMEOPATHIC COLLEGE. Organized 1875. An organic department of the university.

Entrance requirement: A four-year high school education.

Attendance: 80, 88 per cent from Michigan.

Teaching staff: 26, of whom 15 are professors.

Resources available for maintenance: The school and its hospital are supported by state appropriations. Its budget is \$16,400; that of its hospital, \$31,000. The income in fees is \$4515.

Laboratory facilities: The students receive their laboratory instruction in common with the students of the Department of Medicine and Surgery, despite the fact that there is a difference of two years of college work in their preparation.

Clinical facilities: The college has its own hospital of about 100 beds, where clinical instruction is given according to homeopathic principles.

Date of visit: March, 1909.

BATTLE CREEK: *Population, 25,862.*

(3) AMERICAN MEDICAL MISSIONARY COLLEGE. Organized 1895. An independent institution. A divided school, part of the work being given in Chicago, part at Battle Creek. No year is given entire at either place.

Entrance requirement: A four-year high school course or its equivalent. Christians only are admitted. The Chicago teachers are all practitioners; the Battle Creek teachers are connected with the Battle Creek Sanitarium as laboratory workers or physicians.

Attendance: 75.

Teaching staff: 31, of whom 22 are professors, 9 of other grade.

Resources available for maintenance: Income from endowment of \$200,000 and fees.

Laboratory facilities: Anatomy is given in Chicago, where the student spends six weeks during each of the first three years and 30 weeks of the fourth year. The other laboratory courses are given at Battle Creek by the laboratory men and physicians connected with the Battle Creek Sanitarium. Indeed, the school and the

sanitarium are inextricably interwoven. Students assist in the laboratories and treatment-rooms. Their laboratory training thus takes on a decidedly practical character. But this has its disadvantages; for the sanitarium is devoted to the application of certain ideas rather than to untrammelled scientific investigation. Disciples rather than scientists are thus trained. The outfit is adequate for routine work, with abundant practical illustration in chemistry, pathology, bacteriology, and histology. In physiology and pharmacology the provision is slighter.

Clinical facilities: Of the last year, 80 weeks are spent in Chicago, where the students attend St. Luke's Hospital, one or two other institutions, and a dispensary in the school building. For additional clinical teaching they depend on Battle Creek: in the sanitarium they see an abundance of chronic and surgical cases; acute cases are rare, and are accessible chiefly when physicians can ask students to accompany them on their rounds. The clinical laboratory is closely correlated with bedside work. By assisting in the sanitarium and out, the student gets an unusually close experience as far as it goes, but, once more, under the limitations of the therapeutic theories approved by the sanitarium authorities; a critical and investigative spirit is not cultivated.

The instructors of the divided parts of the school form practically separate faculties.

Date of visit: February, 1910.

DETROIT: *Population*, 393,536.

(4) **DETROIT COLLEGE OF MEDICINE.** Organized by merger 1885. An independent institution.

Entrance requirement: A four-year high school diploma or its equivalent, actually enforced.

Attendance: 161, 70 per cent from Michigan (16 per cent from Canada).

Teaching staff: 104, of whom 25 are professors and 79 of other grade. There are no full-time teachers.

Resources available for maintenance: Fees only, amounting to \$22,000-(estimated).

Laboratory facilities: The school is provided with separate laboratories, each with ordinary routine equipment, for the following subjects: chemistry, anatomy, physiology, pathology, clinical microscopy, histology, and bacteriology. There is a slight additional equipment in the way of museum, charts, books, and other teaching adjuncts.

Clinical facilities: The school has access on the usual terms to several hospitals, staff members of which hold positions on the school faculty. The hospital service rotates every three months. At one hospital 100 available beds are perhaps equally

divided between medicine and surgery; elsewhere surgery greatly predominates. Obstetrical work is mainly furnished by the Woman's Hospital and by an outpatient department just started. Post-mortems are hard to get.

The dispensary service is fair.

Date of visit: December, 1909.

(5) DETROIT HOMEOPATHIC COLLEGE. Organized 1899. An independent school.

Entrance requirement: A four-year high school course or its equivalent.

Attendance: 84.

Teaching staff: 85, of whom 17 are professors, 18 of other grade.

Resources available for maintenance: Fees, amounting to \$8010 (estimated).

Laboratory facilities: These are wretched. There is an ordinary laboratory for chemistry; another, much less than ordinary, for bacteriology. The pathological room contained a few dozen specimens in utter disorder; the anatomical room contained a single cadaver. The teaching-rooms are bare, except for chairs and tables; the building is poorly kept. The dean and the secretary have their offices "downtown."

Clinical facilities: The school has access to Grace Hospital, the wards of which contain 56 beds, mostly surgical. Clinics are held two days weekly. The hospital authorities are well disposed towards the school, but the "boys don't take advantage of their opportunities."

There is a dispensary at the school building. It is incredibly bad. Prescriptions are found written on scraps of paper, unnumbered. There are no systematic records.

Date of visit: December, 1909.

General Considerations

MICHIGAN is fortunate in the possession of an alert state board, which enforces with vigor the high school requirement, and may perhaps be counted on to advocate an advance of the state practice standard to meet the educational standard of the state university. As the state furnishes a thoroughly admirable education at relatively slight expense, there is no reason why it should keep the practice of medicine open to low-grade physicians, whether trained within or without its borders. Sound policy would quickly close the two homeopathic schools and, in all probability, the Detroit College of Medicine. To the credit of the latter institution, however, be it said that its officers have heartily coöperated with the state board in the enforcement of a genuine high school standard.

The real problem now agitating the state concerns the medical department of the state university at Ann Arbor. The defects of Ann Arbor as the seat of a medical school have been touched on in these pages. There is no question that, if the entire state university were at Detroit, the medical department would be better off. But

this is by no means equivalent to urging that it be detached or split. The entire detached school is now on trial at Galveston, Indianapolis, New York. It would be well to watch the outcome of those experiments before trying any others. It is already clear that if a university department of medicine is to be genuinely productive, the remote department requires most generous support; for much that is provided at the seat of the university for other departments will have to be duplicated. To create the university spirit in a distant institution is almost like developing a second—though much less expensive—university.

An alternative suggestion looks to the removal to Detroit of part or all of the clinical instruction. If part is removed, clinical teachers must oscillate backward and forward between Detroit and Ann Arbor. Where would the productive clinical teacher have his workshop? Nowhere, in all likelihood. If the entire clinical department is removed, the split school faces the conditions we encounter in Nebraska, California, and Kansas. Once more, let us wait for the successful operation of one of these divided schools before multiplying unpromising experiments. Meanwhile, the state can by increased liberality almost at will develop the medical clinic of the university hospital. Agitation in favor of splitting or removing it may proceed from several considerations,—it is not inspired by sound scientific or educational ideas.

For, Ann Arbor has itself proved what the experience of Germany had previously demonstrated,—that a school of medicine can be developed in a small university town. The ideals are there; the contiguous departments are there; there is an absence of the distractions which have thus far proved so damaging to city clinicians. A faculty of distinction, with a hospital well equipped for the care of the sick, and for teaching and research, can successfully overcome the most serious difficulties of the situation. The problem can be solved by intelligent organization and liberal support. Gaps may indeed remain in the student's experience. But if he has been well drilled in technique and method, his defects will be readily cured by a hospital year. The solution for Michigan may therefore come, as has been proposed, through an effective affiliation of the hospitals of the state with the school of medicine of the state university. The hospitals would profit by a connection of this kind, and they would assist by becoming factors in the education of the future physicians of the state.

MINNESOTA

Population, 2,162,726. Number of physicians, 2204. Ratio, 1 : 981.

Number of medical schools, 1.

MINNEAPOLIS-ST. PAUL: *Population, 552,211.*

- (1) UNIVERSITY OF MINNESOTA COLLEGE OF MEDICINE AND SURGERY. Organized in 1883, it has step by step absorbed all other medical schools in the state, including (1909) the homeopathic department of the university. Elective courses in homeopathic

materia medica and therapeutics are offered on condition that students following them shall receive the degree of Doctor of Medicine in Homeopathy.

Entrance requirement: Two years of college work, specifically including the fundamental sciences and a modern language.

Attendance: 174, 83 per cent from Minnesota.

Teaching staff: 49 professors and 71 of other grade,—total, 120.

Resources available for maintenance: State appropriations. The budget calls for \$71,836. The income from fees is \$16,546.

Laboratory facilities: Excellent, exceedingly attractive, and well organized laboratories are provided for all the scientific branches. The State Laboratory of Public Health is practically part of the school plant. The instruction is in charge of full-time teachers, generously supplied with books, apparatus, and material.

Clinical facilities: The school has hitherto relied on the municipal hospitals and unpaid clinical teachers, with the usual results. Teaching opportunities were both limited in extent and precarious in character. These institutions are in fact not organized, equipped, or conducted with educational requirements in mind. An appropriation has now been made to build a teaching hospital; and a small temporary hospital has been started. Simultaneously, the clinical teaching has been reorganized by placing the chiefs in medicine and surgery respectively on salaries that command the interest and effort of active teachers. The same policy must be applied generally throughout the clinical department.

The dispensary, well attended and long loosely conducted, has recently been reconstructed along the same lines.

Date of visit: May, 1909.

General Considerations

MINNESOTA is perhaps the first state in the Union that may fairly be considered to have solved the most perplexing problems connected with medical education and practice except as to osteopathy. It has indeed still to realize its plans for an adequate clinical establishment of modern character; but there is little doubt that this is only a question of time,—and of a short time, at that. Meanwhile medical education has, with the active coöperation of the state board, been concentrated in the hands of the university, fortunately situated in the heart of the largest community of the state; the state has got rid of rival schools, regular and sectarian, the latter by a perfectly fair provision for separate instruction in sectarian dogmas for any student who is willing to accept a diploma qualified so as to mark that fact. Since all else—*anatomy, physiology, surgery*—are common to and the same for all “schools” of medicine, there is one standard of admission to the department, one quality of instruction, one examination for the degree for all alike. Finally, the educational preliminary qualification of

the state medical school has become the practice preliminary of the state. In future, any person desiring to practise medicine in Minnesota must get as good an education — preliminary and professional — as the state furnishes and requires of its own sons : a regulation both fair and wise, whether viewed from the standpoint of the student or from the broader standpoint of public interest, to which all else is properly subordinate. Henceforth, the success of the school will depend largely on the generosity of the state in developing the clinical teaching, and on the character of the hospital and dispensary which it organizes with that in view.

MISSISSIPPI

Population, 1,786,773. Number of physicians, 2054. Ratio, 1 : 887.
Number of medical schools, 2.

MERIDIAN : *Population, 22,415.*

(1) **MISSISSIPPI MEDICAL COLLEGE.** Organized 1906. A stock company.

Entrance requirement : Nominal.

Attendance : 100, 94 per cent from Mississippi.

Teaching staff : 19, of whom 12 are professors, 7 of other grade.

Resources available for maintenance : Fees, amounting to \$7500 (estimated).

Laboratory facilities : At the date of visit, there was no outfit at all. Subsequent reliable report credits the school with a vat containing four cadavers in a room without other contents, a simple outfit for elementary chemistry, and twenty brand-new microscopes, but no material to use with them.

Clinical facilities : Practically none. Some of the faculty have places on the staff of a small hospital over a mile distant.

There is no dispensary.

Date of visit : January, 1909.

OXFORD-VICKSBURG : (*Population :* Oxford, 2104; Vicksburg, 16,800).

(2) **UNIVERSITY OF MISSISSIPPI, MEDICAL DEPARTMENT.**¹ A divided school. First half organized 1903; second half organized 1909. An organic part of the university.

Entrance requirement : A four-year high school education or its equivalent. Over one-half of this year's entering class had had two or more years of college work.

Attendance : 39.

¹As this report goes to press, it is announced that the clinical end of this school (at Vicksburg) is discontinued. The first two years will continue to be given at Oxford.

Teaching staff: At Oxford, 8 professors, 3 of whom give entire time to this department, and 3 assistants; at Vicksburg, 6 professors and 10 of other grade.

Resources available for maintenance: The department shares the general funds of the university. Its budget calls for \$15,000. Fees amount to \$3500.

Laboratory facilities: (Oxford.) Laboratories, adequate to the needs of the instruction offered, are provided for physiology, pharmacology, histology, and anatomy; pathology and bacteriology are less satisfactory. Chemistry is well cared for in the university laboratory. The teachers need a larger number of competent assistants and helpers; a beginning has been made towards a departmental library.

Clinical facilities: (Vicksburg.) The clinical end has been so recently started that no attempt will be made here to deal with it. It will probably be discontinued.

Date of visit: November, 1909.

General Considerations

Of the two schools, that at Meridian is without merit. At a time when the state has already more doctors than it needs, the starting of a didactic school, conducted by the local practitioners of a small town, is absolutely unjustifiable. The state laws ought to be promptly amended so as to make such ventures impossible.

The state is indeed not favorably situated for the entire training of its own doctors. The state university, the only institution to which the task could fall, is unfortunately located. Its present experiment with a divided school is even more problematical than similar ventures elsewhere; for to the inherent disadvantage of division is to be added the fact that Vicksburg itself is a small town. Moreover, the first half of the school, at Oxford, though distinctly creditable, is far from satisfying its faculty. It is a question whether the university would not do more wisely to concentrate its outlay on the Oxford branch.

Up to this time, the medical profession of Mississippi has been educated mainly in the proprietary schools of the southern states. It would be fortunate indeed if henceforth its members should get at least their first two years at Oxford. To make itself the main factor in the education of the physicians of the state, the university should keep its entrance requirement in touch with the secondary school system. Its present and prospective facilities do not really warrant a higher requirement. Besides, it can perform a more useful service by training a relatively large body of students at the high school level than by training a few on a higher standard. McGill and Toronto do not prove that a high school standard is as good as a college standard; but they do prove that where a high school standard, or even less, is enforced, well chosen teachers, well equipped and liberally sustained laboratories, are capable of producing a very useful type of physician. The present duty of the southern state universities is not to press prematurely to a standard that either cannot be enforced or that, if enforced, will relegate the main army of students to medical schools with-

out either facilities or ideals, but to endeavor themselves to get hold of a sufficient body of students to meet the demand on an enforceable basis, to improve their facilities so that this number can be well trained, and to urge the legislature to make their standard the practice standard of their respective states. Under more favorable circumstances, a decade hence, the state can and should ask more. But just now it is more important to develop the medical department of the state university at the high school level than to push it higher, leaving the training of southern physicians to schools without ideals or resources.

MISSOURI

Population, 3,491,397. Number of physicians, 6323. Ratio 1 : 552.

Number of medical schools, 12 (*plus* 1 postgraduate school).

COLUMBIA: *Population*, 7902.

(1) UNIVERSITY OF MISSOURI SCHOOL OF MEDICINE. A two-year school. Organized 1872.

An organic department of the university.

Entrance requirement: One year of college work.

Attendance: 47, all from Missouri.

Teaching staff: 14, 8 being professors, 6 of other grade.

Resources available for maintenance: The department shares the general income of the university. Its budget calls for \$31,000; fees amount to \$2820.

Laboratory facilities: The medical department occupies a new and well equipped building, excellently adapted to its purposes. The teaching is in charge of full-time instructors of modern training and ideals. A university hospital of 45 beds gives the department the advantage of clinical material and connection, even though the actual instruction is limited to the work of the first two years, a feature of great importance. There is a library, supplied with important current periodicals, domestic and foreign.

Date of visit: April, 1909.

KANSAS CITY: *Population*, 205,022 (*plus* Kansas City, Kan., 81,052).

(2) UNIVERSITY MEDICAL COLLEGE. Organized 1881. An independent institution.

Entrance requirement: Less than a high school education.

Attendance: 174, 82 per cent from Missouri and Kansas.

Teaching staff: 65, 30 being professors, 35 of other grade. There is one full-time teacher.

Resources available for maintenance: Fees, amounting to \$17,600 (estimated).

Laboratory facilities: A single large laboratory is set aside for chemistry of all kinds, and urinalysis: huge bottles are furnished instead of separate reagent sets; histology, pathology, and bacteriology occupy a second room, equipped for routine work in each of these branches. Physiology is similarly provided for. There is the usual dissecting-room, large, clean, and well lighted. There are no books. There is a small museum and a large supply of pathological material.

Clinical facilities: Adjoining the school is the University Hospital, most of the work of which is surgery; but as there are no free beds, it is of no real use to students. The main reliance for clinical instruction is the City Hospital, a beautiful modern structure, in which clinics are held, mainly in the amphitheater, one day weekly from 8 to 12. The school has no access to the clinical laboratory, to autopsies, obstetrics, or infectious diseases, but an out-patient department and a Rescue Home furnish obstetrical opportunity in abundance. Other institutions furnish additional material. The school dispensary—fairly clean—has a large attendance; but it is poorly equipped and loosely conducted. The clinical facilities are, therefore, unsatisfactory in both quality and extent.

Date of visit: November, 1909.

(3) KANSAS CITY HAHNEMANN MEDICAL COLLEGE. Homeopathic. Organized 1888, an independent institution.

Entrance requirement: Less than a high school education.

Attendance: 59.

Teaching staff: 41, of whom 33 are professors, 8 of other grade.

Resources available for maintenance: Fees only, amounting to \$5900 (estimated).

Laboratory facilities: All laboratory work is conducted by one teacher, who serves in the same capacity in the local eclectic and osteopathic schools. The chemical laboratory is small and poor; that for pathology, histology, bacteriology, and embryology, urinalysis and blood work combined, is worse—meagerly equipped and in utter disorder. Anatomy had not as yet started (November). There are a few books.

Clinical facilities: Amphitheater instruction is given one morning a week at the City Hospital.

In the school building is a small dispensary, with an estimated attendance of 6 or 7 a day. A neatly kept card index is employed.

Date of visit: November, 1909.

(4) CENTRAL COLLEGE OF OSTEOPATHY. Established 1902. An independent institution.

Entrance requirement: Nominal.

Attendance: 40.

Teaching staff: 20.

Resources available for maintenance: Fees only, amounting to \$4500 (estimated).

Laboratory facilities: Practically none at all: hopelessly meager appointments in two rooms are denominated respectively chemical and pathological laboratories. Dissection was not in progress at the time of the visit. It is held that "students ought to know anatomy before they dissect,—they get more out of it." A single cadaver was dissected in September and October; another was expected in February.

Clinical facilities: A pay-dispensary is operated, senior students giving "treatments" to patients who pay three dollars a month. Students may on payment of fee attend public clinics at the City Hospital, but the school has no hospital facilities or connections of its own at all.

Date of visit: November, 1909.

KIRKSVILLE: *Population,* 8422.

(5) **AMERICAN SCHOOL OF OSTEOPATHY.** Established 1892 and owned by two individuals.

Entrance requirement: Less than a common school education.

Attendance: 560 (ranging in age from 18 to 54 years).

Teaching staff: 12, with 11 student assistants.

Resources available for maintenance: Fees, amounting to \$89,600 (estimated).

Laboratory facilities: These are absurdly inadequate for the number of students, as is likewise the teaching staff. A single room, with a corresponding preparation room, is used as bacteriological and physiological laboratory, a six weeks' course being given by one teacher to successive squads of 32. In the same way separate additional laboratories are provided for chemistry, anatomy, and pathology. Material for pathological demonstration is bought; there is no museum, and no effort is made to save gross material. The dissecting-room is foul. The "professors" in charge of histology, pathology, and bacteriology are senior students.

Clinical facilities: A hospital of 54 beds adjoins, but its work is practically all "surgery;" the ward cases are "occasionally used for clinics. Students witness operations." Obstetrical work is comparatively scanty. There is no other hospital in the town.

A large dispensary is operated. An instructor is at hand the first time the student administers a "treatment;" after that, "only if summoned." A course of twenty lectures on the fallacies of medicine is given, so that the graduate will know why he does not use "drugs."

The school is a business in which a large margin of profit is secured by its owners. The teaching furnished is of the cheapest kind. Its huge income is therefore largely profit.

Date of visit: November, 1909.

ST. JOSEPH: *Population, 132,954.*

(6) ENSWORTH MEDICAL COLLEGE. Organized in 1876, it has twice merged with other schools. An independent institution.

Entrance requirement: Less than a four-year high school education.

Attendance: 72, 68 per cent from Missouri.

Teaching staff: Numbers 40, 32 being professors, 8 of other grade.

Resources available for maintenance: Fees only, amounting to \$7060 (estimated).

Laboratory facilities: These are very weak. The chemical laboratory is of elementary character; there is a small outfit for physiological demonstration; a single room with little material is provided for pathology, bacteriology, and histology. There is the usual ill kept dissecting-room. There is no museum, books, or teaching accessories. The building is very dirty.

Clinical facilities: These are wholly inadequate. The adjoining hospital, containing six free beds, is of little use. Fifty beds, of which 14 were occupied at the time of visit, are accessible at a Catholic institution, but four-fifths of its work is surgical. Obstetrical work is entirely inadequate; post-mortems are very rare. The available material, scant as it is, is poorly used, as far as teaching is concerned.

There is a small dispensary, without records, organization, or equipment.

Date of visit: November, 1909.

ST. LOUIS: *Population, 698,706.*

(7) WASHINGTON UNIVERSITY MEDICAL DEPARTMENT. Organized 1842. United in 1891 with Washington University, of which it has been since 1907 an organic department. Completely reorganized on modern lines 1910.

Entrance requirement: Four-year high school education. Credentials are passed on and examinations conducted by the university.

Attendance: 178, 60 per cent from Missouri.

Teaching staff: 99, 48 being professors, 51 of other grade. There had been four full-time professors and a few full-time assistants, but as this report goes to press, the entire faculty is undergoing reconstitution. All the laboratory branches, as well as the departments of medicine, surgery, and pediatrics, have been already reorganized on a strict university basis.

Resources available for maintenance: The school shares the general funds of Washington University. Its fee income is \$21,000; its budget (1909-10) \$51,265, (not including \$30,000 spent on the University Hospital). Productive endowments to the extent of \$1,500,000 will become available in 1910-11.

Laboratory facilities: These have hitherto sufficed for only routine work in the fundamental branches, but the reorganization on productive modern lines, already under way, will shortly be completely effected. The museum, though small, is good; a start towards a modern medical library has been made.

Clinical facilities: The school has its own hospital of 98 beds, one-fourth of them free; and has access to other hospitals on the usual footing. The amount of material thus available was fair; but the close affiliation which has been made with the trustees of the Barnes and the Children's Hospitals revolutionizes the clinical situation of the school.

The school controls two dispensaries, — one connected with the University Hospital, the other situated in the medical school building. Their combined attendance is very large.

Date of visit: April, 1909.

(8) ST. LOUIS UNIVERSITY. The school, organized 1901 by merger, was in 1903 purchased for cash by the university, of which it is now an organic part.

Entrance requirement: Less than a high school education.

Attendance: 243, 42 per cent from Missouri.

Teaching staff: 121, 39 being professors, 82 of other grade. There are six full-time instructors with competent helpers; but the assistants are as a rule students.

Resources available for maintenance: Fees, amounting to \$26,630 (estimated), supplemented by small allotment from the university treasury. During a period of seven years (1903-10), the university devoted \$40,817 to its medical school. \$20,000 have been recently subscribed towards an endowment fund for the department.

Laboratory facilities: Excellent teaching laboratories are provided for all the fundamental branches, in addition to which provision has been made for research in several directions.

Clinical facilities: The school has a small hospital of its own (12-16 free beds), and has access on the usual terms to several other institutions. The material, while fair in amount, is scattered and under imperfect control. The hospitals used are not organized, equipped, or conducted with a view to the requirements of modern medical teaching.

The dispensary is fair.

Date of visit: April, 1909.

(9) **ST. LOUIS COLLEGE OF PHYSICIANS AND SURGEONS.** Organized 1869. An independent institution.

Entrance requirement: Nominal.

Attendance: 224.

Teaching staff: 49, of whom 25 are professors, 24 of other grade.

Resources available for maintenance: Fees only, amounting to \$16,035 (estimated).

Laboratory facilities: The school occupies a badly kept building, the inner walls covered with huge advertisements. A single ordinary laboratory is provided for chemistry; there is a make-believe laboratory for experimental physiology; for the school owns the equipment stipulated by the state board, though the dust-covered tables do not indicate use. Rows of empty reagent bottles are also to be seen. The "museum" consists of some cheap photographs and drawings and a few badly preserved wet specimens,—all carefully arranged so as to occupy as much space as possible. Microscopes appear to indicate a laboratory of pathology or bacteriology; but the "individual lockers" were empty. It was explained that "students have to bring slides, holders, and cover-glasses with them, for they furnish their own and keep them at home." Anatomy was "over"—only empty tables were found in the dissecting-room, the sole access to which is by way of a fire-escape.

Clinical facilities: A small, poorly lighted, badly ventilated, and overcrowded hospital is part of the school building. Its operating amphitheater is good. Clinics of slight value are also held at the City Hospital. A few other opportunities of inferior importance are obtained in the usual way.

A dark and dingy suite of rooms serves for a dispensary. The room devoted to gynecology, for instance, is without a window, and contains no equipment except a deal table covered with a sheet.

The school is one of the worst in the country.

Date of visit: April, 1909.

(10) **BARNES MEDICAL COLLEGE.** Organized 1892. An independent institution.

Entrance requirement: Less than a high school education.

Attendance: 124.

Teaching staff: 64, of whom 39 are professors, 25 of other grade.

Resources available for maintenance: Fees only, amounting to \$12,400 (estimated).

Laboratory facilities: A huge "chemical laboratory, the largest in the world devoted to medical education," is the most striking feature; its equipment suffices for elementary work only; another large room with ordinary equipment is devoted to bacteriology, histology, and pathology. A physiological laboratory is equipped

in literal compliance with the state board stipulations. The dissecting-room is spacious and well lighted. There is no museum; few books and few teaching accessories.

Clinical facilities: These are wholly inadequate. The Centenary Hospital, adjoining the school, is without educational importance. Its work is mainly private and almost altogether surgical. The school has access to the City Hospital, too, but its clinics, held one afternoon a week, are of little value.

The college buildings contain a suite of rooms used as a dispensary. A considerable attendance is claimed, but the arrangements are shockingly bad. The rooms are in poor condition and almost devoid of proper equipment.

Date of visit: April, 1909.

(11) AMERICAN MEDICAL COLLEGE. Eclectic. Organized 1878. An independent school.

Entrance requirement: Nominal.

Attendance: 28.

Teaching staff: 28, of whom 25 are professors.

Resources available for maintenance: Fees, amounting to \$3801 (estimated).

Laboratory facilities: Meager equipment is provided for anatomy, chemistry, pathology, and bacteriology. A small amount of apparatus for physiology demonstration, as required by the state board, is displayed in a case. There is no suggestion of use.

Clinical facilities are equally scanty. A weekly clinic can be held at the City Hospital; the rest depends on the professor's connections.

A dispensary room is also provided, and "almost every day some one comes."

Date of visit: April, 1909.

(12) HIPPOCRATEAN COLLEGE OF MEDICINE. A night school. An independent institution, in its third year.

Entrance requirement: Nominal.

Attendance: 31.

Teaching staff: 30 professors, 8 of other grade.

Resources available for maintenance: Fees, amounting to \$3315 (estimated).

Laboratory facilities: A brand-new outfit is visible in the shape of a few microscopes, physiological apparatus, chemical reagents, etc. But though two classes were in session, none of the equipment was in use, nor did its appearance indicate previous use. One of the classes mentioned was receiving eloquent didactic instruction in osteology, the other in anesthesia.

Clinical facilities: Being not yet needed, these are not yet arranged for.

Date of visit: April, 1909.

KANSAS CITY:

(18) **POSTGRADUATE HOSPITAL SCHOOL.** This institution has a hospital of 25 ward beds, containing 15 patients,—2 medical, 13 surgical. There were no students in attendance at the date of the visit. The institution is really a private hospital, but incorporation as a school gives its faculty privileges at the City Hospital.

Date of visit: April, 1909.

General Considerations

MEDICAL education in Missouri is at a low ebb. The state board lacks authority to enforce even a high school preliminary,—the more regrettable as, under the stimulating influence of the state university, an excellent high school system has been developed. Missouri is therefore in the attitude of requiring every boy and girl who wishes to attend the state university to spend four years in good secondary schools supported by the people, but men and women who are charged to safeguard public health may attend medical schools chartered by the state without the assurance of any definite training whatever.¹ In consequence, the state is badly overcrowded with practitioners trained in poor schools, and still maintains some of the poorest schools in the country. Utterly wretched are (1) Kansas City Hahnemann Medical College, (2) Central College of Osteopathy, (3) American School of Osteopathy (Kirksville), (4) St. Louis College of Physicians and Surgeons, (5) American Medical College, (6) Hippocratean College of Medicine; feeble and without promise are (7) Barnes Medical College, (8) Ensworth Medical College, and (9) University Medical College, though the last named is distinctly superior to the other eight. There remain the two-year school conducted by the state university, the medical department of Washington University, and the St. Louis University School of Medicine.

There are in the state of Missouri fifty-odd academic institutions, of which only two have resources adequate to support medical schools, viz., the state university and Washington University. Of the several towns in the state capable of supplying clinical material, only one—St. Louis—contains a strong resident university. Washington University, St. Louis, is therefore at this writing marked out as the natural patron of medical education in Missouri.

Its importance is bound to be more than local. Aside from its obvious possibilities as a productive scientific center, Washington University must be the main factor in the training of physicians for the southwest country; the city of St. Louis has in this section an even clearer opportunity than has Chicago in the middle west, New York in the east, or Boston in New England. For there is no other large city

¹That is what a certificate from a county school commissioner amounts to, no matter what it pretends to certify.

south of Minneapolis or as far west as the Pacific which as completely meets all the requirements of the case.

There is abundant evidence to indicate that those interested in Washington University appreciate its "manifest destiny;" it bids fair shortly to possess faculty, laboratories, and hospital conforming in every respect to ideal standards. It is, however, worth asking whether it may not supplement its own resources by some form of coöperation. The state university formerly conducted a four-year school at Columbia; realizing that its clinical instruction could not without immense expenditure be brought to the present level of the scientific years, it has had the wisdom and courage to confine its efforts to the first two years. The easy expedient of a clinical end at Kansas City or elsewhere, it has with equal wisdom and firmness rejected. Its resources and influence, however, may not impossibly be enlisted in behalf of the medical work of Washington University, for the latter institution is in position to use effectively whatever can be placed at its disposal. Should St. Louis University receive financial support enabling it to enforce the same entrance standard as the other two institutions mentioned, it also would be wise to forego clinical instruction, turning over its students in their last two years to Washington University. A second clinical establishment on the same scale is neither desirable nor likely. Nor will St. Louis University or its students be permanently satisfied with an old-fashioned clinical department superposed on its modern laboratory foundation.

NEBRASKA

Population, 1,069,579. Number of physicians, 1776. Ratio, 1: 602.

Number of medical schools, 3.

LINCOLN-OMAHA: (*Population*: Lincoln, 53,667; Omaha, including South Omaha, 164,519).

(1) COLLEGE OF MEDICINE, UNIVERSITY OF NEBRASKA. Organized 1881. Affiliated in 1902 with the state university, of which it is now an organic part. A divided school, the first two years being given at the university (Lincoln), the last two at Omaha.

Entrance requirement: Two years of college work.

Attendance: 122.

Teaching staff: 84, of whom 38 are professors, 46 of other grade. The laboratory branches are taught by full-time teachers, using in the main student or practitioner assistants.

Resources available for maintenance: The department is supported by state appropriations. Its income in fees for the year ending June, 1909, was \$4905; its budget amounts to \$20,612, reckoning only items due directly to the medical department.

Laboratory facilities: (Lincoln.) The department has the necessary laboratories, on the whole fairly equipped. The instructors are active men of modern training, eager to do research work. They are, however, in position to accomplish little in this direction for lack of space, proper assistance, and funds. The opportunities are nevertheless adequate for good routine undergraduate teaching. Animals are provided in abundance; there is a good library and a fair collection of necessary teaching adjuncts.

Clinical facilities: (Omaha.) The school has the privilege of the County Hospital for half the year, and staff privileges at the Methodist Hospital and several other institutions. These institutions are, of course, not equipped or conducted with regard to teaching. For example, the clinical pathologist of the school is not now a member of the staff of either institution; in consequence of which fact, the teaching of this important branch is isolated. Section visits are, however, arranged. There is little scientific intercourse or pedagogical interplay between the severed laboratory and clinical ends at Lincoln and Omaha respectively.

The dispensary has a fair attendance, but is not well organized.

Date of visit: April, 1909.

(2) LINCOLN MEDICAL COLLEGE. Eclectic. Organized 1890. Nominally the medical department of Cotner University.

Entrance requirement: Nominal.

Attendance: 42, 77 per cent from Nebraska.

Teaching staff: 34, all of whom are professors.

Resources available for maintenance: Fees, amounting to \$3794 (estimated).

Laboratory facilities: There are practically no laboratory facilities beyond a separate room set aside for dissecting and the meager chemical laboratory of Cotner University. Some little microscopical work may also be carried on at the latter institution.

Clinical facilities: There are no definite clinical opportunities, not even a dispensary.

Date of visit: April, 1909.

OMAHA

(3) JOHN A. CREIGHTON MEDICAL COLLEGE. Organized 1892. Integral part of Creighton University.

Entrance requirement: Less than a four-year high school education.

Attendance: 175.

Teaching staff: 49, 28 of whom are professors, 21 of other grade. One teacher devotes his entire time to medical instruction.

Resources available for maintenance: Mainly fees, amounting to \$17,850 (estimated).

Laboratory facilities: Student laboratories, with individual equipment adequate to routine instruction, are provided for chemistry, pathology, histology, and bacteriology; the professors of the last three subjects have private laboratories besides. The provision for anatomy is poor; it comprises an ordinary dissecting-room and a lecture-room, equipped with a papier-mâché model, charts, a defective skeleton, and some odds and ends of bones. The outfit for experimental physiology and pharmacology is small. Animals are obtained as needed. There is a small museum and a small library. Quiz-compendes are sold on the premises.

Clinical facilities: The school has access to several hospitals where clinical material is obtained. Its use is subject to the customary limitations. The main hospital is two miles from the school. Though 90-100 beds are there available for ward teaching, students cannot work in the clinical laboratory of the hospital. Opportunities at the other hospitals are not considerable.

Several large and well arranged rooms in the college building are used for dispensary work, one hour daily. The attendance is fair.

Date of visit: April, 1909.

General Considerations

IN Nebraska, as in most of the western states, the hope of sound instruction in medicine lies with the state university. There is apparently no other institution in the state which can confidently count on spending much more on a medical department than fees bring in, though Creighton has succeeded in obtaining gifts for building purposes. The problem confronting the state university, however, is not simple. It has undertaken to require two years of college work for entrance, while the state law does not contemplate the enforcement of even a high school standard. The strengthening of the law, by way of backing the state university, ought not, however, to be difficult, for the eclectic school is surely without influence and Creighton has promised to come to the higher standard in 1910.

A more perplexing problem arises from the division of the state university department between Omaha and Lincoln. The edges of the two halves do not now touch. If our position in respect to divided schools is correct, the state must choose between wholly dropping clinical instruction and organizing a complete school on one of the two sites now partially occupied. An entire department at Omaha seems at this moment the more feasible.

NEW ENGLAND

THE medical schools of Massachusetts, Maine, Vermont, New Hampshire, Connecticut (nine in all), may profitably be considered together, for the reputable ones among them are largely engaged in training local students, 85 per cent of their enrolment

coming from this section. At present, the ratio of physicians to population in this section is 1: 592, not reckoning osteopaths. The section is thus badly overcrowded with physicians; and as population is increasing slowly, there is no possibility that its increase will within a generation bring about a satisfactory adjustment. In the matter of distribution, the usual conditions prevail: cities and small towns are alike oversupplied.¹

It is clear, then, that New England will need no more physicians for years to come; it can of course begin none too soon the process of substituting a higher grade of physician for what it now has. To bring about a gradual reconstruction of the profession, it is important that certain legal changes be promptly made. Massachusetts, for example, remains one of three states which obstructs the improvement of medical education by permitting non-graduates to be examined for license. The law should not only require graduation from a reputable medical school, but should, in the interest of the public, fix with due warning a minimum basis for admission thereto, as Connecticut has wisely done, and should empower and require the state boards to refuse examination to graduates of schools whose facilities are inadequate. Of course, a thorough practical examination would still further increase the effectiveness of the boards in protecting the public against ill trained practitioners.

If, now, the law prescribed a thorough knowledge of physics, chemistry, and biology—surely feasible in New England if feasible in Minnesota and Indiana—as the minimum basis of medical education, attendance in medical schools would promptly shrink in number and improve in quality. A more critical attitude on the part of the state boards and the student body in reference to the educational advantages offered by the several schools would probably result in a reconstruction of the situation somewhat along these lines:

A thoroughly wretched institution, like the College of Physicians and Surgeons of Boston, would be at once wiped out. The clinical departments of Dartmouth, Bowdoin, and the University of Vermont would certainly be lopped off; there is no good reason why these institutions—colleges all of them—should be concerned with medicine at all. The mere fact that they are all old schools is a poor reason for continuing them if they fail to do justice to the student, and thereby fail to subserve

¹ By way of example, the following are cited at random:

		population	681	number of physicians	4
Massachusetts:	Onset				
State ratio, 1: 567	Westport		900	"	3
Maine:	Saco	"	6270	"	14
State ratio, 1: 600	Springfield	"	588	"	2
	Lisbon Falls	"	300	"	3
New Hampshire:	Centerville	"	88	"	2
State ratio, 1: 651	Lisbon	"	2100	"	6
	Orford	"	794	"	3
Vermont:	Plainfield	"	940	"	3
State ratio, 1: 584	Newhaven	"	640	"	3
	Randolph	"	3000	"	8
Connecticut:	Stefney Depot	"	480	"	2
State ratio, 1: 740	Suffield	"	3400	"	7
Rhode Island:	Centerdale	"	870	"	2
State ratio, 1: 794	Thornton	"	415	"	2
	Wickford	"	1515	"	4

the public interest. They originated as didactic schools, and as such were quite as well off in small communities as anywhere else. They find themselves now compelled to teach clinical medicine by practical methods. They cannot command the necessary material nor the financial resources required to procure it. Why should either the students or the public make a sacrifice merely to enable them to continue, when it is easily possible for both to do better? The argument that these small schools train all-round doctors who go out into the country, prepared to do everything, is refuted by the obvious fact that schools, unable to command obstetrical cases, contagious diseases, and the ailments that throng dispensaries, are not really sending out the type of practitioner which, by their own admission, the rural districts need.

Whether even Boston will or should continue to support two regular schools—Harvard and Tufts—is decidedly doubtful. The enrolment of Tufts, even on the high school basis, is much swollen. The strict enforcement of that standard—and why should it not be enforced?—will greatly reduce the attendance. The inevitable elevation of requirements will still further cut it down. The school has no resources but fees; out of them it cannot possibly provide for the legitimate demands of the near future. It is difficult to see how the department in question can avoid being seriously crippled; for its remarkable prosperity has depended to no slight extent on the inducement held out by low entrance standards. Its only hope of escape is through endowment, first, so that it may develop its laboratories independently of fee income, next, that it may secure its own hospital. Why should such an expensive step be recommended? If New England is in future to be supplied with high-grade doctors, the quickest and cheapest road to that end is to complete Harvard and to develop Yale, rather than to maintain several more or less imperfect institutions. Whatever may once have been the case, local competition needs no longer be relied on to expose defects and to stimulate improvement. Keen scientific and educational emulation over a wide area provides a sharper incentive and involves no waste. It is, therefore, of supreme importance that higher standards be legalized in New England and that the clinical independence of the Harvard Medical School be established. The medical department of Yale is modestly working in the same spirit and to the same end. To these two institutions the future of medical education in New England may for many years to come be safely left.

NEW HAMPSHIRE

Population, 448,140. Number of physicians, 680. Ratio, 1 : 651.

Number of medical schools, 1.

HANOVER : *Population*, 1951.

DARTMOUTH MEDICAL SCHOOL. Organized 1798. The medical department of Dartmouth College.

Entrance requirement: A four-year high school education.

Attendance: 58, 91 per cent from New England.

Teaching staff: 24, of whom 17 are professors, 7 of other grade. There are two professors giving entire time to medical subjects, viz., pathology, bacteriology, and physiology. Chemistry, botany, embryology, and comparative anatomy are taught in the regular college laboratories. Ten clinical professors and one lecturer are non-resident.

Resources available for maintenance: The department is carried by the general resources of Dartmouth College. The income in fees is \$5583 (estimated).

Laboratory facilities: Excellent working laboratories are provided for pathology, bacteriology, histology, physiology, and for the medical subjects cared for in the academic department. Every student serves four weeks during his second year as assistant in the pathological laboratory and thus gets an admirable practical experience. Anatomy, taught by a practitioner, has not as yet been developed on modern lines. There are good departmental libraries, supplied with books and current periodicals, foreign and domestic.

Clinical facilities: These are very limited. The college controls a hospital of 40 beds, of which 24 are in wards at reduced rates. These are available for teaching; to some extent private cases may also be demonstratively used. Still further to weaken the teaching value of the hospital, surgery predominates to the extent of 80 per cent of all cases. Students are employed to assist in surgical operations, but the backbone of clinical instruction—an adequate clinic in internal medicine—is lacking.

An isolation pavilion of fourteen beds for college use is employed for teaching as occasion presents. For obstetrical work, students sojourn for a period in Boston or New York. There are 12-14 post-mortems a year.

There is no dispensary.

Date of visit: March, 1910.

General Considerations

DARTMOUTH is already providing excellent modern instruction in most of the work of the first two years. The development of its clinical work presents a serious difficulty. The village is rather inaccessible; the surrounding country is thinly populated,—containing perhaps 50,000 people in a zone 100 miles north and south. Surgical cases are attracted easily enough. Can medical cases be attracted too? Certainly not without a very large outlay in the form of professional salaries and hospital expense. To what extent a compulsory fifth year spent as interne in a large hospital would answer in compensation of defective facilities is a question: much depends on the hospitals available for the purpose. That the school cannot much longer continue in its present stage is clear: for with the requirement of two years of college work

for entrance in 1910, it asks a student to spend six years to get a degree in medicine, in attaining which he can enjoy only a very limited opportunity to learn internal medicine. It is safe to predict that on that basis the present facilities will not hold the student body together during the third and fourth years.

[See "*New England*," p. 261.]

NEW YORK

Population, 8,706,089. Number of physicians, 14,117. Ratio, 1: 617.

Number of medical schools, 11, *plus* 4 postgraduate schools.

ALBANY: *Population*, 101,461.

(1) ALBANY MEDICAL COLLEGE. Organized 1838. Nominally the medical department of Union University; actually an independent institution in all but form.

Entrance requirement: The Regents' Medical Student Certificate.

Attendance: 180, 91 per cent from New York state.

Teaching staff: 94, of whom 16 are professors, 78 of other grade. The professor of chemistry, the associate professor of physiology, and the director of the Bender Laboratory are non-practitioners.

Resources available for maintenance: Practically fees only, amounting to \$20,276. \$10,000 have been bequeathed to the school as the nucleus of a building fund.

Laboratory facilities: The Bender Laboratory, at a considerable distance from the school,—with endowment sufficient to keep up insurance and repairs,—provides instruction in pathology, bacteriology, histology (not including embryology), clinical microscopy, and a small amount of demonstrative work in physiology. There is no course in pharmacology. The head of the laboratory is pathologist to the Albany Hospital and other institutions; autopsies are thus procured. The laboratory has made itself practically self-supporting through board of health and similar work. The college, after equipping it, now contributes to its support no more than it absolutely must in order to keep it going. In consequence, there is now little active research in progress.

At the medical school building good laboratories are provided for chemistry and physiological chemistry, and the usual dissecting-room with a few charts, models, etc. Otherwise equipment is scant. The laboratory branches have been slighted in pursuance of the policy of paying annual dividends to the faculty.

Clinical facilities: The main clinical reliance is the Albany Hospital, in which perhaps 200 beds are available. But three-fourths of the work of the hospital is surgery. The service in medicine and surgery rotates every three months. On the medical side, students work up assigned cases. In general surgery, students can only

"look on." They have no access to the obstetrical ward, though students serving as externs are allowed to observe free cases. Other institutions furnish supplementary material in obstetrics, pediatrics, mental diseases, etc.

The school uses two dispensaries: that at the hospital is unimportant; the South End Dispensary has a fair attendance and is conducted in an orderly manner.

Date of visit: January, 1910.

BROOKLYN: *Population, 1,543,630.*

(2) **LONG ISLAND COLLEGE HOSPITAL.** Organized 1858. An independent institution.

Entrance requirement: The Regents' Medical Student Certificate.

Attendance: 360, 89 per cent from New York state.

Teaching staff: 94, 9 being professors, 85 of other grade. There is no full-time instructor belonging to the school.

Resources available for maintenance: Fees, amounting to \$61,398. Practically this amount is supplemented by advantageous arrangements to be described below in connection with laboratory and clinical facilities.

Laboratory facilities: The Hoagland Laboratory (endowment \$131,000), independent of but affiliated with this school, sets aside a suite of rooms, in which pathology, bacteriology, and histology are taught to medical students. The college is thus partly relieved of the expense involved in the equipment and teaching of these branches. The opportunities provided are of routine character. The research work of the laboratory and its teaching are entirely distinct.

The college itself contains a good and well kept dissecting-room, in which drawing and modeling are employed, and two good, though ordinary, chemical laboratories.

There is no library, no museum, no physiological or pharmacological laboratory, though a demonstration course in physiology is offered. Freed from the necessity of providing certain laboratories, fees might have been used to provide others; instead of that, the surplus is annually divided among the faculty. What gifts have not provided, the college goes on lacking.

Clinical facilities: The school adjoins, and is legally one with, the Long Island College Hospital, with 200 beds usable in teaching. The hospital, though new, is not designed to serve modern ideas in medical teaching. It lacks adequate laboratories; specimens must be carried by students to the college building for examination.

For dispensary purposes, the college gets the use of the Polhemus Clinic, built at a cost of \$500,000, having a productive endowment of \$400,000.

The entire plant—school and clinic—is admirably kept.

Date of visit: March, 1909.

BUFFALO: *Population*, 401,441.

(8) **UNIVERSITY OF BUFFALO MEDICAL DEPARTMENT.** Organized 1846. Despite the university charter, the University of Buffalo is a fiction. Schools of medicine, law, dentistry, and pharmacy are aggregated under the designation; but they are to all intents and purposes independent schools, each living on its own fees.

Entrance requirement: Admission is on the basis of the Regents' Medical Student Certificate, being the equivalent of a high school education.

Attendance: 193.

Teaching staff: 97, of whom 38 are professors.

Resources available for maintenance: Fees amounting to \$31,984.

Laboratory facilities: The school has a conventionally adequate equipment for anatomy, ordinary laboratories for chemistry, bacteriology, and pathology, a meager outfit in physiology,—it having been found that the students cannot profitably do much experimental work themselves,—nothing for pharmacology. The "whole-time" teachers have in the main other duties besides teaching in medicine: the professor of pathology and bacteriology is registrar, the chemist officiates in the pharmacy department, the anatomist in the dental department. There is a small museum, but a good library of 8000 volumes, current German and English periodicals, with a librarian in charge.

Clinical facilities: For clinical teaching, the school relies mainly on the Buffalo General Hospital close by. It has access to some 200 beds, used for demonstrative teaching in the wards. Records are made by internes. Students do no clinical laboratory work in connection with special patients, the teaching in clinical microscopy being separately given at the college. Infectious diseases are didactically taught. Clinical obstetrics is imperfectly organized. Besides the Buffalo General Hospital, a weekly clinic is held at the County Hospital, four miles distant, four clinics at the Sisters' Hospital, one and a half miles away, etc.

Despite the size of the city, the college dispensary is wretched. It has an attendance of perhaps 3000 during the college year, skin, eye, and ear cases mainly. A definite statement is impossible because there are no systematic records. The rooms are ill equipped. Records consist of brief pencil notes in separate books, usually without index. The work is hastily and superficially done, and its influence on the students, so far as it goes, must be thoroughly bad. The catalogue states, however, that as attendance in the dispensary is obligatory, each student "will secure an unusually thorough training in the taking and recording of histories."

Date of visit: October, 1909.

NEW YORK: *Population*, 4,563,604.

(4) **COLLEGE OF PHYSICIANS AND SURGEONS.** The Medical Department of Columbia University. Organized in 1807; affiliated with Columbia College 1860; an organic part of Columbia University since 1891.

Entrance requirement: The Regents' Medical Student Certificate, which must include physics and chemistry. Of the present first-year class of 86, 48 have the bachelor's degree, 11 more have had at least two years of college work: the department is therefore already close to the two-year college basis, which goes into effect 1910-11.

Attendance: 312, 56 per cent from New York state.

Teaching staff: 176, of whom 38 are professors, 138 of other grade.

Resources available for maintenance: The department has special endowments amounting to \$832,351. Fees amount to \$75,500. The budget calls for \$239,072, including maintenance of Sloane Maternity Hospital and the Vanderbilt Clinic.

Laboratory facilities: The school laboratories are of modern equipment and organization, conducted by full-time instructors, amply assisted. Teaching and research are thus actively prosecuted in all departments. Anatomy deserves to be especially mentioned, as perhaps the most elaborate plant of its kind in the country. The school lacks a general library, though books and periodicals are available in several departments and in the students' study.

Clinical facilities: The school is admirably situated in respect to the Sloane Maternity Hospital (to which gynecology is now to be added) and the Vanderbilt Clinic (dispensary), which adjoin it and are under its control. Both philanthropically and pedagogically, they are effectively conducted on modern lines.

In other respects, the clinical department labors under the disadvantages common to the schools of New York. The situation will be more fully discussed below; suffice it here to say that various hospitals furnish an abundance of clinical material of all kinds under limitations that interfere with effective scientific or pedagogic use, and make exceedingly difficult anything like intimate interplay between laboratory and clinical teaching. Nowhere has the school rights; at Bellevue (municipal hospital), custom establishes a qualified security, liable, however, to be disregarded; elsewhere the basis is purely personal. Permission has recently been obtained to institute clinical clerking in a few places.

Date of visit: October, 1909.

(5) **CORNELL UNIVERSITY MEDICAL COLLEGE.** Organized 1898. An organic department of Cornell University.

Entrance requirement: Three years of college work.

Attendance: 207.

Teaching staff: 132, 32 being professors, 100 of other grade.

Resources available for maintenance: The department is liberally supported. Its budget (New York city) calls for \$209,888; income from fees, \$24,410; Ithaca: budget, \$32,840; income from fees is negligible.

Laboratory facilities: The school laboratories in New York are, in general, of modern equipment and organization, anatomy and chemistry being, however, less elaborately developed than physiology and pathology. The professor of anatomy is a practising surgeon. Otherwise the laboratories are in charge of full-time teachers, properly assisted, devoting themselves unreservedly to teaching and research. Despite geographical separation from the university at Ithaca, the department is animated by university ideals: in part, this is ascribable to actual intercourse, in part, to the selection of teachers devoted to science, whom the university has so generously supported that they have reproduced the university spirit. At Ithaca—the seat of Cornell University—the first year's instruction is also offered: the departments of anatomy and physiology as there organized and conducted are thoroughly admirable, with their own additional teaching staff, supported by separate funds.

Clinical facilities: The major part of the clinical instruction is given at the Bellevue Hospital, directly opposite the college, in which the school enjoys the same privileges as Columbia and New York Universities. The service is good in point of extent; limitations which render it unsatisfactory will be discussed below. Supplementary hospitals increase the amount of available material, but always under serious pedagogic restrictions. Intimate correlation of laboratories and clinic is thus not feasible.

A thoroughly satisfactory dispensary, well conducted, occupies part of the school building.

Date of visit: February, 1910.

(6) UNIVERSITY AND BELLEVUE HOSPITAL MEDICAL COLLEGE. Formed in 1898 by merger of University Medical College (established 1841) and Bellevue Hospital Medical College (established 1861). An integral part of New York University.

Entrance requirement: The Regents' Medical Student Certificate, representing a four-year high school education.

Attendance: 408, 74 per cent from New York state.

Teaching staff: 164, 37 being professors, 127 of other grade.

Resources available for maintenance: The school is mainly dependent on fees, amounting to \$76,115; these are supplemented by gifts and income from endowment amounting to about \$11,000.

Laboratory facilities: The laboratories are developed unevenly, as the resources of the school are not equal to uniform promotion of all the medical sciences. Pathology is excellently organized and equipped both for teaching and research; in other branches good teaching facilities rather than any considerable opportunity for investigation have been aimed at. The departments of pathology, physiology, pharmacology, and chemistry are in charge of full-time teachers. Anatomy, including histology and embryology, has just been reorganized on the same basis. Available laboratory accommodations are being largely increased by an addition now in process of erection.

Clinical facilities: The major part of the clinical instruction is given at Bellevue Hospital, opposite the college, in which the school enjoys the same privileges as Cornell and Columbia. The service is good in point of extent. Limitations which make it unsatisfactory will be discussed below. Supplementary hospitals increase the amount of available material, but always under serious pedagogic restrictions. Intimate correlation of laboratories and clinic within the hospital is thus not feasible.

A thoroughly satisfactory dispensary, well conducted, occupies part of the school building.

Date of visit: November, 1909.

(7) **FORDHAM UNIVERSITY SCHOOL OF MEDICINE.** Organized 1905. An organic part of Fordham University.

Entrance requirement: Something over a four-year high school education.

Attendance: 42, 83 per cent from New York state.

Teaching staff: 72, of whom 32 are professors, 40 of other grade. Two instructors give their entire time to the medical school. Chemistry and physiology are taught in the university by full-time teachers.

Resources available for maintenance: Fees, amounting to \$7880 (estimated 1908-9), supplemented by appropriations amounting to several thousand dollars annually from the general funds of the university.

Laboratory facilities: Chemistry and physiology are explained above. The equipment in pathology, bacteriology, and histology is adequate for the routine instruction of the small student body. Anatomy is limited to dissection. There is a library with current scientific journals.

Clinical facilities: Much of the clinical work of the school is carried on at Fordham Hospital, a municipal institution close by; the school has no voice in making its staff appointments. Supplementary opportunities are obtained at other institutions,—scattered, as is generally the case, with the medical schools of the city. The amount of material available is adequate, but it cannot be organized or controlled.

There is a good and growing dispensary service connected with Fordham Hospital.

Date of visit: October, 1909.

(8) NEW YORK MEDICAL COLLEGE AND HOSPITAL FOR WOMEN. Homeopathic. Organized 1863. An independent school.

Entrance requirement: Regents' Medical Student Certificate, equivalent to a four-year high school course.

Attendance: 24.

Teaching staff: 45, 23 being professors, 22 of other grade. No teacher devotes entire time to the school.

Resources available for maintenance: Fees, amounting to \$2545.

Laboratory facilities: Attractive and well kept laboratories are provided for pathology, bacteriology, and histology together, chemistry and physiology and anatomy. The equipment is simple, but recent. There are a small library, a number of anatomical charts, and some normal and pathological preparations. Autopsy material is reported as scarce.

Clinical facilities: These consist of the hospital, occupying the same building and containing 35 available beds, most of the cases being surgical, and of the usual rotating services scattered among other hospitals, public and private. They do not include infectious diseases.

Most of the first floor of the school building is given over to a dispensary.

Date of visit: October, 1909.

(9) ECLECTIC MEDICAL COLLEGE. Organized 1865. An independent school.

Entrance requirement: Regents' Medical Student Certificate.

Attendance: 96, 84 per cent from New York state.

Teaching staff: 45, 16 being professors, 29 of other grade. No one devotes full time to teaching.

Resources available for maintenance: Mainly fees, amounting to \$8311.

Laboratory facilities: The chemical laboratory, adequate for routine teaching, is active. Otherwise the facilities are weak: one room is used for bacteriology, histology, pathology, and clinical microscopy; this with the dissecting-room completes the laboratory outfit. There is no museum; but the school possesses a small collection of models, a materia medica cabinet, a stereopticon, and a fair-sized library, of which the books are mostly not recent.

Clinical facilities: There is no eclectic hospital. Twice weekly three students spend their entire afternoon at the Sydenham Hospital (80 free beds). There are some

supplementary clinics of the usual kind. There is a small dispensary in the school building and an outside dispensary is also used. The clinical facilities are utterly inadequate in respect to both extent and control.

Date of visit: March, 1909.

(10) NEW YORK HOMEOPATHIC MEDICAL COLLEGE AND FLOWER HOSPITAL. Organized 1858. An independent institution.

Entrance requirement: Regents' Medical Student Certificate.

Attendance: 159, 88 per cent from New York.

Teaching staff: 65, of whom 31 are professors, 34 of other grade. The professors of chemistry, physiology, pathology, and bacteriology are full-time teachers.

Resources available for maintenance: The school and hospital budgets are combined. The institution has an endowment of \$600,000, which carries a hospital of 125 free beds, dispensary with ambulance service, etc. Income from student fees amounts to \$18,658.

Laboratory facilities: An attractive, well kept laboratory with models and bone-mounts is provided for anatomy; a single laboratory for chemistry; one, with a small museum, for pathology and histology; and others, with ordinary equipment, for bacteriology and physiology. There is a library of several thousand volumes.

Clinical facilities: Though the school possesses its own hospital, clinical teaching has not hitherto been so organized as to take the fullest advantage of it. The records are meager; the clinical laboratory inadequate. Improvements are, however, under way.

The dispensary enjoys a very large attendance.

Date of visit: December, 1909.

SYRACUSE: *Population*, 127,281.

(11) COLLEGE OF MEDICINE, SYRACUSE UNIVERSITY. Organized 1872. An integral department of the university.

Entrance requirement: A year's work in science in addition to the Regents' Medical Student Certificate. Credentials are passed upon by the academic authorities. Of the present class of 40, the first on the new basis, 20 had had a year or more of college work; the rest presented high school or preparatory school certificates in the required sciences.

Attendance: 151, 90 per cent from New York state.

Teaching staff: 57, of whom 15 are professors and 42 of other grade. The sciences are taught by full-time teachers.

Resources available for maintenance: Income, almost wholly from fees, amounting to \$28,861.

Laboratory facilities: Chemistry is well cared for in the university laboratories. The equipment in anatomy, physiology, pathology, including clinical microscopy and bacteriology, is adequate for instruction; the income of the school has been consistently and intelligently used to develop these departments. They are all in charge of full-time teachers, each provided with a competent helper. There is a good library, in charge of a librarian, but no museum.

Clinical facilities: Clinical facilities have not yet been put on the same modern basis as the laboratory branches. They are insufficient in respect to both extent and control. The school relies mainly on two local hospitals of about 150 beds, providing ward and bedside work in general medicine, surgery, and pediatrics, surgery predominating. The hospitals do not contain a working clinical laboratory for students. Supplementary opportunities are provided by several other institutions in the usual manner. The work in obstetrics is not sufficient.

Students attend the city dispensary, which is, from an educational point of view, of doubtful value. It has an attendance of 10,000; but the records, though systematic, are so brief that the experience would hardly conduce to thorough and careful habits. The head clinical professors have apparently been indifferent to it.

Date of visit: October, 1909.

POSTGRADUATE SCHOOLS

(1) BROOKLYN POSTGRADUATE MEDICAL SCHOOL. Established 1907.

Entrance requirement: The M.D. degree.

Attendance: Students are scarce; four or five may be in attendance at any one time.

Teaching staff: 52, of whom 19 are professors, 33 of other grade.

Resources available for maintenance: Fees.

Laboratory facilities: None.

Clinical facilities: The school offers graduate courses mainly in the Williamsburg Hospital, most of the cases in which are surgical. The hospital itself is wretched and has no teaching facilities worth mentioning. It is even without a clinical laboratory.

The existence of the school is a reproach to the state. It now operates on a limited charter from the state department of education, and is enabled to continue because it is aided by the city. It deserved no charter in the first place, and it deserves no recognition from the city now.

Date of visit: January, 1910.

(2) NEW YORK POSTGRADUATE SCHOOL. Established 1881.

Entrance requirement: The M.D. degree.

Attendance: There is an average attendance of 90 students in winter, 50 in summer.

Short courses, usually six weeks in length and of a practical nature, are given.

Formerly, the so-called "general" ticket was most popular; now, specialties are in demand and the medical courses are gaining on the surgical.

Teaching staff: 156, of whom 38 are professors, 118 of other grade.

Resources available for maintenance: The school, long without productive resources, has recently received a gift of \$1,600,000, which, after paying debts and providing needed extensions, will leave a productive endowment of perhaps \$400,000.

Laboratory facilities: These are very meager. A single room is devoted to laboratory work; little or no research or experimental work is carried on.

Clinical facilities: The Postgraduate Hospital is of modern construction and is excellently conducted. It contains 225 beds, 75 per cent of which are free. The new building will add 170 beds and space for clinical and laboratory teaching. Other hospitals are also used.

There is a good dispensary, very largely attended.

Date of visit: January, 1910.

(3) NEW YORK POLYCLINIC MEDICAL SCHOOL AND HOSPITAL. Organized 1881.

Entrance requirement: The M.D. degree.

Attendance: 25 to 50 students are in attendance usually.

Teaching staff: 149, of whom 24 are professors, 125 of other grade.

Resources available for maintenance: Fees.

Laboratory facilities: There is a pathological laboratory for practical work.

Clinical facilities: Postgraduate instruction is offered in the Polyclinic Hospital (100 beds), in the dispensary, which is largely attended, and in a considerable number of other hospitals, with which members of the faculty are connected as staff officers. The instruction is practical in character.

Date of visit: December, 1909.

(4) MANHATTAN EYE, EAR, AND THROAT HOSPITAL POSTGRADUATE SCHOOL. Established 1869. An independent institution.

Entrance requirement: The M.D. degree.

Attendance: There is an average attendance of 12 students. Courses range from one to six months or more in length. Students who attend at least three months are eligible to appointment as clinical assistants.

Teaching staff: 11.

Resources available for maintenance: Fees and income from endowment of \$170,000, the latter yielding income sufficient to carry mortgage.

Laboratory facilities: These consist of two laboratories, one for pathological, the other for bacteriological, examinations.

Clinical facilities: There is an excellent modern hospital, with 125 ward beds. The teaching is demonstrative and practical in character, though assistants enjoy larger opportunities.

The dispensary has a very large daily attendance.

Date of visit: April, 1910.

General Considerations

NEW YORK has a double duty and a double opportunity in medical education. It must in the first place produce most of its own physicians and a considerable share of those who practise in neighboring states, which, like New Jersey, are without medical schools. Its eleven medical schools have so energetically done their part in this matter that New York itself and all the adjoining states are suffering from plethora.¹ There is, therefore, no section of the Union which is at this moment readier for an upward step: population is comparatively well distributed, communication is easy, roads are good, educational facilities abundant, and doctors superabundant. In the city of New York the two-year college requirement can be met at Columbia, New York University, and without expense at the College of the City of New York. Students outside the metropolis are, up to a certain number, similarly cared for by Cornell University.

But New York may be fairly asked to do more than produce doctors, however excellent the type. Its vast hospital and university resources should make it the Berlin or Vienna of the continent; a genuinely productive contributor to medical progress; the center to which, in the intervals of a busy life, physicians will repair to freshen their knowledge and to renew their professional youth; to which the young graduate from the interior—from the schools of Pittsburgh, Ann Arbor, Madison, Iowa City—will look for the extension of his scientific and clinical experience.

Little has as yet been done to realize this opportunity. The postgraduate schools are of very limited scope; the great New York schools have been in the main clinically unproductive. Why?

The reason is a matter of history. The schools that are now called university departments grew up as proprietary institutions. They have never been adequately financed. They obtained, and still obtain, their clinical facilities at each other's expense: that is to say, what one gets, the other loses. In the Bellevue Hospital a *modus vivendi* was found by division, with an arrangement that enables two schools to watch and obstruct the third and a lay board to oversee all three; in the great

¹The ratios prove this: New York, 1: 617; New Jersey, 1: 950; Delaware, 1: 906; Connecticut, 1: 740; Rhode Island, 1: 724; Vermont, 1: 534.

private hospitals personal considerations nominate the staff, and the school subsequently negotiates with the appointees. Competition, professional and institutional, has molded the hospital situation, and in consequence clinical faculties are organized on a personal rather than a scientific or educational basis. Doubtless if Columbia, New York University, and Cornell had at this moment a free hand, they would retain some of their clinical teachers in their present positions. But at bottom this is a fortunate accident rather than a natural result: it just happens that some competent teachers find themselves in prominent hospital positions; but the system is not designed to pick them out. In the event of their withdrawal, their successors in the hospital would not be sought on the basis of scientific eminence, and if not in the hospital, then not in the school. Under these conditions, the schools can hardly be said to have ideals, policy, or genuinely organized departments, except by fortunate accident. For the nonce, there may be a continuous medical service here, clinical clerks there, post-mortems elsewhere. But the favoring conditions are perishable. The schools skate on thin ice. An accident may shatter the arrangement and convert a "department" into a congeries of courses lacking unity in conduct and aim. Indeed, most of the clinical departments now conform to just this description: there are a half-dozen professors of medicine and surgery in place of one; and no possibility of team-work on their part.

For many years nothing more than this was asked; but meanwhile the school point of view has changed. Doubtless there are professors who are satisfied to go on producing doctors and to let other institutions produce knowledge; but the productivity of the first and second years has suggested another ideal. The problems of clinical medicine have been the more sharply formulated as the pathologist and the bacteriologist have passed up to the clinician the results of their own scientific activity. The teachers of medicine must attack these problems. To attack them, they require quite another environment. The *modus vivendi* which enabled rival schools to lecture in the same hospitals does not provide the conditions in which a clinical scientist can work.

We have now suggested two results that medical schools in New York must attain: (1) they must make doctors in sufficient number; (2) they must actively participate in the advance of medical science. If the standpoint previously expounded is correct, the same institutions must do both. Of the eleven medical schools now existing in the state, only the bona-fide university departments can then expect to survive: outside of New York city, Syracuse University alone has just now a chance. The schools of Buffalo, Albany, and Brooklyn belong to the past. None of the three has even yet entirely emerged from the fee-dividing stage. Syracuse, with a smaller total fee income than any of them, devotes every dollar to the development of the fundamental branches and has fairly earned support from outside.

Of the New York city schools, Columbia and Cornell alone have at this moment any financial strength. Neither of them, indeed, is in actual possession of sufficient endowment; but there is little reason to doubt that what is additionally requisite

will be forthcoming. New York University is much less secure. Its maintenance at its present level is conditioned on adherence to a lower admission standard than is scientifically justifiable or educationally necessary. It cannot much longer resist the upward trend; for its scientific faculty—and thence the initial stimulus comes—is apt to chafe under the limitations which the lower standard imposes. Whether on the higher basis the school will be a permanent factor in the situation is thus largely a question of adequate support from the outside in the next few years. None of the other local schools have at this date a substantial foundation of any sort.

The ground being thus cleared, the clinical difficulty still presses. Institutional competition is reduced; but personal and professional competition remain. Why should non-schoolmen freely retire for the sake of schoolmen? The situation is curiously deadlocked. The school faculties are not now made up on educational lines,—they cannot be. If the number of schools were reduced to two or three, it would still be true that their clinical faculties would in the main be constituted of men very much like the more important men omitted from them. Such being the case, the hospitals and the doctors naturally refuse to yield to the universities; and until they do yield, the universities cannot freely reconstruct their clinical branches. The faculty men would themselves doubtless make common cause with the outsiders as against a university which asks a free hand in order to bring in a body of clinical teachers from the outside. The usual hospital staff will not vacate for the present type of clinical faculty, because the faculty lacks commanding scientific and pedagogical preëminence; nor will the present faculties surrender to the universities for the purpose of enabling the latter to fill the places with men of another type.

Under these circumstances, palliation may perhaps come through some coöperative effort. Tension and friction will at least decrease as the number of schools diminishes. Clinical teaching in the municipal hospitals, perhaps, could then be controlled under some form of federation. The vast resources of these great institutions might under combined management form a great postgraduate and special clinic; and the municipal authorities might conceivably relax, for the common benefit of a single organization and for the glory of a great enterprise, restrictions which they have found necessary in dealing with several institutions engaged simultaneously in training boys. Unquestionably such action would bring the present postgraduate schools into the university, where they ought to be.

With this arrangement consummated, however, the schools still lack teaching hospitals in which the undergraduate student can be vigorously disciplined while his freely chosen teachers are themselves engaged in intensive clinical research. The teaching hospital must be in close geographical proximity to, and in the most intimate intercommunication with, the scientific laboratories. In the case of Columbia, every physical and educational condition is already satisfied by Roosevelt Hospital: the scientific laboratories, the dispensary, the maternity hospital, are on one side of the street; the general hospital on the other. Together they would form an ideally

compact and complete plant. That they are not so operated cannot but be deplored as a tragic mischance. It is to the world at large of no consequence how they happened to drift apart. There are interests at stake that are entitled to outweigh all personal and historic considerations.

That an effective affiliation is feasible between a department of medicine and an endowed hospital, Western Reserve and Lakeside Hospital assuredly prove, just as Toronto proves the same as between a medical school and a municipal hospital. There are in New York city a dozen hospitals, each of them capable of becoming a teaching hospital in the best sense of the term. Their usefulness from every point of view would increase in precisely the measure in which they lend themselves to this function. They are already comfortable and indeed charming retreats for the sick and injured. Why should they be satisfied to be that, and nothing more? They are favorably known to the poor and to the philanthropic of New York city; and they are deservedly proud of their repute. Is it a defect of intelligence or of imagination that prevents them from reaching out for more substantial laurels? Perhaps neither, so much as a disinclination to depersonalize the hospital staff management; for depersonalization, in hospital management as in faculty appointments, each involving the other, is the condition precedent to reconstitution of medical education in New York. Without sacrificing a jot of their local distinction, without limiting in the slightest degree their usefulness to the sick poor, the New York hospitals may—any or all of them—win a place as scientific laboratories beside Guy's and St. Bartholomew's, the Royal Infirmary of Edinburgh, the Charité of Berlin, the Hôtel-Dieu of Paris. Mount Sinai, the Presbyterian, St. Luke's, and Roosevelt Hospitals might under such conditions be familiar names in medical science; as well known to the progressive clinicians of St. Petersburg, Vienna, Edinburgh, St. Louis, and San Francisco, as they are to the stricken widows of the East Side of New York city itself. What the Sloane Maternity Hospital wisely does for a single department, the general hospitals can do for general medicine and surgery. The great universities on the ground can be trusted with the opportunities and responsibilities which effective affiliation would give them. In the absence of such affiliation, separate endowment, procured for the purpose, must provide teaching hospitals in which the universities will be supreme. Would any contend that these hospitals are likely to be less admirably conducted than the unattached hospitals we have named? or that the university faculty of medicine, freely recruited, is likely to prove a less competent staff than present methods procure?

The issue is one that cannot be much longer fought off: Columbia and Cornell are already graduate schools in medicine. Their laboratories produce a high-grade student, to whom the university is bound to furnish a clinical opportunity of the same quality. Neither school can now do it. An effective affiliation, or endowment adequate to support a teaching hospital and a scientific medical faculty, is therefore their immediate need and desert.

NORTH CAROLINA

Population, 2,142,084. Number of physicians { 1761 (Amer. Med. Direct.). Ratio, 1:1216;
 Number of medical schools, 4. { 1932 (Polk). " 1:1110.

CHAPEL HILL: *Population*, 1181.

(1) UNIVERSITY OF NORTH CAROLINA MEDICAL DEPARTMENT. A half-school. Established 1890. An organic part of the university.

Entrance requirement: A year of college work—not, however, strictly enforced during this, the first session in which it has been required.

Attendance: 74; 95 per cent from North Carolina.

Teaching staff: 15, of whom 10 are professors who take part in the work of the department. The instructors are trained, full-time teachers.

Resources available for maintenance: The department is provided for in the university budget. Its budget calls for \$12,000. Its income in fees is \$6500.

Laboratory facilities: The laboratories at Chapel Hill are in general adequate to good routine teaching of the small student body. The equipment covers pathology, bacteriology, histology, physiology, and pharmacology. Anatomy is inferior. Animals are provided for experimental work. The general scientific laboratories of the university are excellent; a small annual appropriation is available for books and periodicals. The work is intelligently planned and conducted on modern lines.

Date of visit: February, 1909.

CHARLOTTE: *Population*, 36,320.

(2) NORTH CAROLINA MEDICAL COLLEGE. Organized 1887, it has given degrees since 1893. A stock company; professorships are represented by stock and can be sold subject to the concurrence (never yet refused) of the faculty.

Entrance requirement: Nominal.

Attendance: 94, 87 per cent from North Carolina.

Teaching staff: 32, of whom 19 are professors, 13 of other grade.

Resources available for maintenance: Fees, amounting to \$8345 (estimated), a large part being required to carry a building mortgage and to retire the debt.

Laboratory facilities: These comprise a poor chemical laboratory, containing one set of reagents, a wretched dissecting room, and a meager outfit for pathology, bacteriology, and histology. There is no museum, no library, and no teaching aids of any kind whatever. No post-mortems are even claimed.

Clinical facilities: The school, in virtue of a subscription, holds four weekly clinics at a colored hospital of 35 beds; other hospital connections are unimportant. Obstetrical cases are rare.

There is a poor dispensary, with a small attendance, in the school building. It occupies a fair suite of rooms.

Date of visit: February, 1909.

WAKE FOREST: *Population, 900.*

(3) **WAKE FOREST COLLEGE SCHOOL OF MEDICINE.** A half-school. Organized 1902. An integral part of Wake Forest College.

Entrance requirement: Two years of college work, actually enforced, but resting upon the irregular secondary school education characteristic of the section.

Attendance: 53.

Teaching staff: 6 whole-time instructors take part in the work of the department; two of them devote their entire time to medical instruction.

Resources available for maintenance: The budget is part of the college budget. Fees amount to \$2225.

Laboratory facilities: The laboratories of this little school are, as far as they go, models in their way. Everything about them indicates intelligence and earnestness. The dissecting-room is clean and odorless, the bodies undergoing dissection being cared for in the most approved modern manner. Separate laboratories, properly equipped, are provided for ordinary undergraduate work in bacteriology, pathology, and histology, and the instructor has a private laboratory besides. Chemistry is taught in the well equipped college laboratory; physiology is slight; there is no pharmacology. There is a small museum; animals, charts, and books are provided.

Date of visit: February, 1909.

RALEIGH: *Population, 20,533.*

(4) **LEONARD MEDICAL SCHOOL.** Colored. Organized 1882. An integral part of Shaw University.

Entrance requirement: Less than four-year high school education.

Attendance: 125.

Teaching staff: 9, of whom 8 are professors, one of other grade.

Resources available for maintenance: Mainly fees and contributions, amounting to \$4721, practically all of which is paid to the practitioner teachers.

Laboratory facilities: These comprise a clean and exceedingly well kept dissecting-room, a slight chemical laboratory, and a still slighter equipment for pathology.

There are no library, no museum, and no teaching accessories. It is evident that the policy of paying practitioners has absorbed the resources of a school that exists for purely philanthropic objects.

Clinical facilities: These are hardly more than nominal. The school has access to a sixteen-bed hospital, containing at the time of the visit three patients. There is no dispensary at all. About thirty thousand dollars are, however, now available for building a hospital and improving laboratories.

Date of visit: February, 1909.

General Considerations

THE state of North Carolina makes a comparatively satisfactory showing in the matter of ratio between population and physicians; but this may, perhaps, in some measure be due to the fact that practitioners, unlicensed and unregistered, exist undisturbed in the remote districts. It is futile to maintain a low standard in order to prepare doctors for those parts; for the graduates, instead of scattering to them, huddle together in the small towns already amply supplied. It is admitted that all eligible locations are overcrowded. There is not the slightest danger that the necessary supply of doctors would be threatened if, for instance, the practice of medicine in the state were pitched on the plane of entrance to the state university; higher than that it probably ought not to be at this time.

The standard suggested — any real standard whatsoever, indeed — would quickly dispose of the thoroughly wretched Charlotte establishment. No clinical school would remain in the state. The two half-schools — at Wake Forest and at the state university — are capable of doing acceptable work within the limits of their present resources. Both of these schools now require college work for entrance. Is this step to be generally recommended at this time to southern universities with medical departments? Without attempting to arrive at a decision, it may be pointed out that there are two sides to the question. On the one hand, the college requirement is essential to the symmetrical development of the medical curriculum; on the other, a good medical course can be given at an actual high school level, provided that facilities and teaching are developed to a high point of efficiency. How will the university best serve the state,— by training a small number at the higher level, or by getting actual control of the state situation on a high school basis before pushing ahead to a basis just generally feasible in more highly developed sections of the country? The University of Michigan is only now requiring college work for entrance; it became a strong school of immense influence in its own community on a lower basis. Undoubtedly it is right now to go to the higher standard; perhaps it should have done so earlier. But its present efficiency and influence show—as McGill and Toronto show—that if a lower standard is felt to be a reason for better teaching and not an excuse for poor teaching, an institution unfavorably located for the initiation of

compact and complete plant. That they are not so operated cannot but be deplored as a tragic mischance. It is to the world at large of no consequence how they happened to drift apart. There are interests at stake that are entitled to outweigh all personal and historic considerations.

That an effective affiliation is feasible between a department of medicine and an endowed hospital, Western Reserve and Lakeside Hospital assuredly prove, just as Toronto proves the same as between a medical school and a municipal hospital. There are in New York city a dozen hospitals, each of them capable of becoming a teaching hospital in the best sense of the term. Their usefulness from every point of view would increase in precisely the measure in which they lend themselves to this function. They are already comfortable and indeed charming retreats for the sick and injured. Why should they be satisfied to be that, and nothing more? They are favorably known to the poor and to the philanthropic of New York city; and they are deservedly proud of their repute. Is it a defect of intelligence or of imagination that prevents them from reaching out for more substantial laurels? Perhaps neither, so much as a disinclination to depersonalize the hospital staff management; for depersonalization, in hospital management as in faculty appointments, each involving the other, is the condition precedent to reconstitution of medical education in New York. Without sacrificing a jot of their local distinction, without limiting in the slightest degree their usefulness to the sick poor, the New York hospitals may—any or all of them—win a place as scientific laboratories beside Guy's and St. Bartholomew's, the Royal Infirmary of Edinburgh, the Charité of Berlin, the Hôtel-Dieu of Paris. Mount Sinai, the Presbyterian, St. Luke's, and Roosevelt Hospitals might under such conditions be familiar names in medical science; as well known to the progressive clinicians of St. Petersburg, Vienna, Edinburgh, St. Louis, and San Francisco, as they are to the stricken widows of the East Side of New York city itself. What the Sloane Maternity Hospital wisely does for a single department, the general hospitals can do for general medicine and surgery. The great universities on the ground can be trusted with the opportunities and responsibilities which effective affiliation would give them. In the absence of such affiliation, separate endowment, procured for the purpose, must provide teaching hospitals in which the universities will be supreme. Would any contend that these hospitals are likely to be less admirably conducted than the unattached hospitals we have named? or that the university faculty of medicine, freely recruited, is likely to prove a less competent staff than present methods procure?

The issue is one that cannot be much longer fought off: Columbia and Cornell are already graduate schools in medicine. Their laboratories produce a high-grade student, to whom the university is bound to furnish a clinical opportunity of the same quality. Neither school can now do it. An effective affiliation, or endowment adequate to support a teaching hospital and a scientific medical faculty, is therefore their immediate need and desert.

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Entrance requirement: A year of college work—not, however, strictly enforced during this, the first session in which it has been required.

Attendance: 74; 95 per cent from North Carolina.

Teaching staff: 15, of whom 10 are professors who take part in the work of the department. The instructors are trained, full-time teachers.

Resources available for maintenance: The department is provided for in the university budget. Its budget calls for \$12,000. Its income in fees is \$6500.

Laboratory facilities: The laboratories at Chapel Hill are in general adequate to good routine teaching of the small student body. The equipment covers pathology, bacteriology, histology, physiology, and pharmacology. Anatomy is inferior. Animals are provided for experimental work. The general scientific laboratories of the university are excellent; a small annual appropriation is available for books and periodicals. The work is intelligently planned and conducted on modern lines.

Date of visit: February, 1909.

CHARLOTTE: *Population*, 36,320.

(2) NORTH CAROLINA MEDICAL COLLEGE. Organized 1887, it has given degrees since 1893. A stock company; professorships are represented by stock and can be sold subject to the concurrence (never yet refused) of the faculty.

Entrance requirement: Nominal.

Attendance: 94, 87 per cent from North Carolina.

Teaching staff: 32, of whom 19 are professors, 13 of other grade.

Resources available for maintenance: Fees, amounting to \$8345 (estimated), a large part being required to carry a building mortgage and to retire the debt.

Laboratory facilities: These comprise a poor chemical laboratory, containing one set of reagents, a wretched dissecting room, and a meager outfit for pathology, bacteriology, and histology. There is no museum, no library, and no teaching aids of any kind whatever. No post-mortems are even claimed.

Resources available for maintenance: Fees, amounting to \$7500.

Laboratory facilities: A new building has just been provided; it contains an ordinary laboratory for elementary inorganic chemistry and a good dissecting-room. Separate laboratories, as yet meagerly equipped, are set aside for histology, pathology, and bacteriology. There is a small museum and a small collection of books, but practically no other teaching accessories. The course of instruction is not graded.

Clinical facilities: The school adjoins the Seton Hospital, with which it is affiliated. This institution has 60 beds, of which not over 24 are usable,—those mostly surgical. Little medical material is accessible. The teaching is carried on mainly in the amphitheater.

Sophomores are required to attend public clinics at the city hospital (never given by eclectic teachers), but the school does not know whether they attend or not.

A dispensary with a small attendance is connected with the hospital.

Dates of visits: December, 1909; April, 1910.

(8) **PULTE MEDICAL COLLEGE.** Homeopathic. Established 1872. An independent institution.

Entrance requirement: A four-year high school education or its equivalent.

Attendance: 16.

Teaching staff: 36, of whom 24 are professors, 12 of other grade.

Resources available for maintenance: Fees, amounting to \$1325 (estimated).

Laboratory facilities: Anything more woe-begone than the laboratories of this institution would be difficult to imagine. The dissecting-room is a dark apartment in the basement, in which (December 14) the year's dissecting had not yet begun; but the teaching of anatomy was not therefore halted. A disorderly room with a small amount of morbid material and equipment is known as the pathological and bacteriological laboratory. The chemical laboratory contains a few desks, with reagent bottles, mostly empty. There are a few old books in the faculty-room. No charts, museum, models, or other teaching accessories are to be seen.

Clinical facilities: There was formerly a hospital in the same building, but it is now closed. The school claims to hold clinics at certain private institutions, in which, however, the work is mainly surgical and the cases not free. Except by attending amphitheater clinics at the city hospital, it is not clear that the Pulte students can regularly see any hospital medical cases at all.

There is an inexpressibly bad dispensary in the school building.

Date of visit: December, 1909.

CLEVELAND: *Population*, 522,475.

(4) CLEVELAND HOMEOPATHIC MEDICAL COLLEGE. Organized 1849. An independent institution.

Entrance requirement: A four-year high school education or its equivalent.

Attendance: 46.

Teaching staff: 61, of whom 30 are professors, 31 of other grade.

Resources available for maintenance: Fees, amounting to \$5750.

Laboratory facilities: These comprise a good laboratory for physiology, in which vigorous teaching was in progress. In other subjects—chemistry, anatomy, pathology, and bacteriology—the provision is only fair. There are several cases of old medical books in the office.

Clinical facilities: These are limited to the City Hospital,—a large institution three miles distant, in which one-fifth of the material is assigned to this school. Adjoining the school building is a homeopathic hospital, with which the school was once intimately connected; they have now drifted apart.

Several rooms in the basement and on the first floor of the college building are used for a dispensary. Their equipment is poor; no complete or lasting records are kept.

Date of visit: December, 1909.

(5) WESTERN RESERVE UNIVERSITY MEDICAL DEPARTMENT. Organized 1843; in 1881 joined Western Reserve University, of which it is now an organic part.

Entrance requirement: Three years of college work.

Attendance: 98, of whom 70 per cent are from Ohio.

Teaching staff: 100, of whom 18 are professors, 82 of other grade. The laboratories are, with the exception of anatomy, manned with teachers giving their entire time to the school.

Resources available for maintenance: The department has endowments aggregating \$784,865. Its income from fees is \$11,000. Its budget calls for \$63,000.

Laboratory facilities: Excellent laboratories, in which teaching and research are both vigorously prosecuted, are provided for all the fundamental scientific branches. A special endowment carries the department of experimental medicine. Books, museum, and other teaching accessories, all in abundance, are at hand.

Clinical facilities: From the faculty of the school is appointed the staff of Lakeside Hospital, an endowed institution of 215 available beds, thoroughly modern in construction and equipment. The school has erected a clinical laboratory on the premises, so that close correlation of bedside and laboratory work is easily attainable. The relation of the two institutions has progressively become more intimate,

and in the same measure mutually more helpful. The situation is one that might be reproduced with infinite advantage in New York, Boston, Chicago, etc.

In addition, the school holds clinics at the City Hospital, Charity Hospital, St. Ann's Maternity Hospital, etc. It commands, therefore, all the material that is necessary. It requires now only additional endowment in order that it may completely command the time of clinical teachers.

The Lakeside Dispensary, admirably conducted, is used by the school on the same terms as the Lakeside Hospital. The attendance is large and varied. There is also an excellent dispensary connected with the Charity Hospital.

Date of visit: December, 1909.

(6) **COLLEGE OF PHYSICIANS AND SURGEONS.**¹ Organized 1863; since 1896 nominally the medical department of Ohio Wesleyan University.

Entrance requirement: Four-year high school education or equivalent.

Attendance: 89, 92 per cent from Ohio.

Teaching staff: Numbers 59, of whom 18 are professors, 41 of other grade. There are no teachers devoting their entire time to the school.

Resources available for maintenance: Fees only, amounting to \$9520 (estimated).

Laboratory facilities: These cover only routine needs in chemistry, anatomy, bacteriology, and pathology. There is a meager supply of apparatus for experimental physiology, no museum, few books, and little else in the way of teaching accessories.

Clinical facilities: The school holds clinics at the City Hospital during four months, and at several private institutions, in which, however, the work is largely surgical. It has access to a fair amount of material, but under limitations that greatly impair its value. All the hospitals are at considerable distance from the school; none of them is provided with clinical laboratories for student use. In consequence, the teaching is of the discontinuous demonstrative type. Close contact of student with patient or systematic following of cases is impossible. Obstetrical work is limited to an out-patient service.

The dispensary is small and poorly organized. The attendance is slight.

Date of visit: December, 1909.

COLUMBUS: *Population,* 158,649.

(7) **STARLING-OHIO MEDICAL COLLEGE.** Formed by merger in 1907. An independent institution.

Entrance requirement: A four-year high school education or its equivalent.

¹As this report goes to press, it is announced that this school has been consolidated with the Medical Department of Western Reserve University.

Attendance: 220.

Teaching staff: 60, of whom 32 are professors, 28 of other grade. There are no teachers giving their whole time to medical instructions. Some of the laboratory instruction is given by men who also teach in Ohio State University.

Resources available for maintenance: Fees only, amounting to \$27,500.

Laboratory facilities: The school has a large plant. Laboratories adequately equipped for routine instruction are provided for anatomy, chemistry, physiological chemistry, bacteriology, pathology, and histology. There is no experimental pharmacology. Student assistants are employed. There is no evidence anywhere of original activity or interest. The school has a library, museum, and a supply of teaching accessories.

Clinical facilities: The school controls two hospitals, in one of which—containing, however, only 40 usable beds—it might introduce modern teaching methods. The other hospital, containing 150 beds, is a Catholic institution. Neither hospital is built, organized, or equipped with the necessities of teaching in view. No pavilion for contagious diseases is accessible. The city has thus far done nothing to provide proper hospital facilities for the sick poor. The state institutions are, however, available.

The school dispensaries enjoy an abundance of material, but lack equipment, organization, and oversight.

The conditions described are doubtless to some extent due to the difficulty of welding two schools into one. Vigorous measures might, however, produce here a good institution.

Date of visit: December, 1909.

TOLEDO: *Population,* 178,753.

(8) **TOLEDO MEDICAL COLLEGE.** Organized 1883. The medical department of Toledo University, a municipal institution of uncertain status and without substantial resources.

Entrance requirement: A four-year high school education or its equivalent.

Attendance: 32.

Teaching staff: 48, of whom 16 are professors, 32 of other grade. No one gives entire time to medical classes.

Resources available for maintenance: Fees only, amounting to \$3240 (estimated).

Laboratory facilities: The school has nothing that can be fairly dignified by the name of laboratory. Separate rooms, badly kept and with meager equipment, are provided for chemistry, anatomy, pathology, and bacteriology. The class-rooms are bare: no charts, bones, skeleton, or museum are in evidence. There is a small library in the office.

Clinical facilities: These are entirely inadequate. The school formerly held clinics at the County Hospital, but the connection has been severed in consequence of a political overturning. It still has access to two hospitals: in one of them it holds a small number of clinics, both medical and surgical; in the other it conducts a surgical clinic twice a week. In neither of them can such material as exists be thoroughly used for teaching purposes.

There is a wretched little dispensary in the college building.

Date of visit: February, 1910.

General Considerations

Of the eight medical schools of Ohio one has already won a permanent place and two more have possibilities. The present administration of the state law is tightening about the other five, and there is every reason to suppose that they will all shortly have to submit to the inevitable. Just why the law should be tenderly applied is not clear. The state is rich, prosperous, and well supplied with secondary schools, though the competition of state-supported institutions has hitherto interfered with their systematic organization; and two or three doctors now contest every field capable of decently supporting one. It would appear feasible at once to enforce a genuine four-year high school preliminary and forthwith to move towards the higher standard just declared in Indiana.

The most prosperous universities of the state are, from the standpoint of medical education, fortunately situated: Western Reserve, at Cleveland, the Ohio State University, at Columbus, the University of Cincinnati, at Cincinnati. Of the future of Western Reserve there is no doubt. It is already one of the substantial schools of the country. Its clinical problem has been solved on lines that create a precedent worthy to be generally followed. Its financial resources are, however, decidedly inferior to its deserts and ideals. A keener appreciation of its worth must surely result in substantial improvement of its position in this respect.

The state of Ohio has a duty in reference to medical education and public health, the performance of which is made comparatively simple by the appropriate location at Columbus of the most important of its three state universities. As for the rest, it is a question of money and ideals. The plant of the Starling-Ohio school can probably be readily secured. Its educational value though not large may be readily increased; its laboratories could be easily consolidated, remodeled, and reorganized under trained teachers with paid assistants. On the clinical side, the difficulties are more serious, though not improbably the present Protestant Hospital could be developed into a good teaching hospital if the state supplied the necessary funds. The problem of procuring clinical teachers of modern type would still remain.

The city of Cincinnati seems definitely committed to the project of a municipal university. Coincidentally, the building of the new municipal hospital furnishes an unusual opportunity to its medical department. A municipal university has two ob-

vious sources of support: taxation may well be employed at least to maintain departments calculated to meet local needs,—industrial, social, or cultural; the pride of its citizens ought to supplement its tax income by way of supporting departments like medicine, whose main function can hardly be circumscribed by local considerations. The future of the medical department is thus likely to depend on the intelligence and munificence of the private benefactors of the university. The city can contribute its hospital and part of the current maintenance. Thus far the university has surely deserved well for its success in bringing together the rival schools which long divided and demoralized the field; the schools themselves made generous sacrifice of property rights in order to consummate the merger. It should, however, be added that this impersonal attitude has yet to be applied to the organization of the faculty. Property rights were yielded; professorial titles remain. Now, if the professors of the medical department of the University of Cincinnati really desire—as the coming together of the schools signifies—that there should be one strong medical school in the city, they must realize that a school in which there are nine professors of medicine and nine professors of surgery is as yet without organization. They ought therefore to surrender their titles to the university with the request that each clinical department be reconstructed by placing at its head the single individual marked out for the position, in the best judgment of the trustees of the university, by his scientific eminence and pedagogic skill.

OKLAHOMA

Population, 1,592,401. Number of physicians, 2703. Ratio, 1: 589.

Number of medical schools, 2.

NORMAN: *Population*, 3389.

(1) STATE UNIVERSITY OF OKLAHOMA, SCHOOL OF MEDICINE. Organized 1898. A half-school. An integral part of the university.

Entrance requirement: One year of college work in sciences.

Attendance: 22, all but 2 from Oklahoma.

Teaching staff: The instruction is given mainly by whole-time university teachers, two of whom devote their entire time to the department; the dean of the department is a practising physician.

Resources available for maintenance: The department is supported out of the general revenues of the university; fees amount to \$600.

Laboratory facilities: Modest laboratories, adequate to routine work, are provided in anatomy, physiology, physiological chemistry, pharmacology, histology, pathology,

and bacteriology. The laboratory of the state board of health is in the department. There are a small museum and a small departmental library.

Date of visit: November, 1909.

OKLAHOMA CITY: *Population, 49,899.*

(2) EPWORTH COLLEGE OF MEDICINE.¹ Organized 1904. A stock company, nominally the medical department of Epworth University.

Entrance requirement: Nominal.

Attendance: 51.

Teaching staff: 42, of whom 28 are professors, 14 of other grade.

Resources available for maintenance: Fees, amounting to \$4285.

Laboratory facilities: These are hardly more than nominal: a little apparatus has been procured for each of the several subjects, but all is disorderly and neglected.

Clinical facilities: Clinics are held in a private hospital, where perhaps 30 beds, mostly surgical, are available.

There is no school dispensary.

Date of visit: November, 1909.

General Considerations

THE new commonwealth of Oklahoma may, if wise, avoid most of the evils which this report has described; for though they have already appeared, they have not taken deep root. Immigration—of physicians, among others—has been so rapid that the state has easily three times as many doctors as it needs. They pour in from the schools of St. Louis, Kansas City, and Chicago. If, however, the state wishes a high-grade supply only, it must speedily define a standard such as will (1) suppress commercial schools,—as, for example, that now nominally belonging to Epworth University,—and (2) by the same action exclude inferior doctors trained elsewhere. Having done this, only an institution with considerable resources, derived either from taxes or from endowment, will even attempt to conduct a medical school in the state: which is as it should be.

The state university is of course marked out for the work. Its present modest beginning must be developed. Perhaps it will have at once to occupy Oklahoma City with a clinical department so as to obtain control of the field; though, if its sole right could be established without that, the project might well be delayed for a time. A good medical school is so costly that a new university does not want to anticipate the responsibility. Possible expenditures on such a department have in a way been crippled in advance by the absurd duplication of state institutions. There are

¹ As this report goes to press, it is stated that this school has been consolidated with the medical department of the state university, which thus becomes a complete school of the divided type.

26 state-supported educational institutions in Oklahoma. In other respects the people of the state have been quick to profit by the experience of other sections. Oklahoma City has not in its building recapitulated the phases of growth elsewhere. Its streets are of asphalt, its large buildings are fire-proof, their plumbing modern; they have begun with enamel, not with tin or zinc, bathtubs. Why do they not in the same way avoid the weary and costly errors in educational organization that the states about them have one after the other made? Ordinary intelligence, surveying the states of the middle west to-day after their educational experience of the last thirty years, could reduce its lessons to a few simple propositions which would be universally accepted. No two judges would differ as to the principle that state institutions of higher learning should be concentrated in a town of assured future; that proprietary medical schools should be forbidden, etc. The older states are painfully correcting or paying for their blunders: should Oklahoma, to soothe the local pride of this little town or that, run up a bill of the same sort?

OREGON

Population, 505,339. Number of physicians, 782. Ratio, 1: 646.

Number of medical schools, 2.

PORTLAND: *Population*, 131,508.

(1) UNIVERSITY OF OREGON MEDICAL DEPARTMENT. Organized 1887. Nominally the medical department of the state university.

Entrance requirement: Less than a high school education.

Attendance: 72, 65 per cent from Oregon.

Teaching staff: 41, of whom 14 are professors, 27 of other grade. No teachers devote full time to the school.

Resources available for maintenance: An annual appropriation of \$1000 from the funds of the state university, and fees amounting to \$8000 (estimated).

Laboratory facilities: The school occupies a frame building, wretchedly kept. It has one good laboratory, that of bacteriology, conducted by the city bacteriologist. Other branches, like chemistry, anatomy, pathology, and histology, are provided in the usual perfunctory manner. There is a scanty equipment in physiology; one thousand to fifteen hundred books, mostly old text-books, form the library. Other teaching accessories there are none.

Clinical facilities: The school has access by courtesy to two hospitals, in which students may look on. They cannot work in the clinical laboratories of the hospital, and there is no clinical laboratory at the school. Obstetrical cases are entirely insufficient.

The dispensary has an attendance varying from two to seven daily.

Date of visit: May, 1909.

SALEM: *Population, 7287.*¹

(2) WILLAMETTE UNIVERSITY MEDICAL DEPARTMENT. Organized 1865. An independent institution in all but name.

Entrance requirement: Less than a high school education.

Attendance: 29, 86 per cent from Oregon.

Teaching staff: 16, of whom 15 are professors.

Resources available for maintenance: Fees, amounting to \$3580 (estimated).

Laboratory facilities: The school has a fairly well equipped laboratory for bacteriology and histology; a small laboratory, with little material and no running water for chemistry; and a dissecting-room. There are no museum, no books, no other teaching accessories. Inquiry on the subject of physiology elicited the response that the "apparatus is in a physician's office downtown."

Clinical facilities: These are hardly more than nominal. Students have some access to a private hospital of 30 beds in Salem and to the State Asylum and Penitentiary a few miles distant. "Medical clinics depend on cases." Obstetrical cases "depend on private practice."

There is no dispensary at all.

Date of visit: May, 1909.

General Considerations

NEITHER of these schools has either resources or ideals; there is no justification for their existence. The entire coast is oversupplied with doctors by immigration; unless something better can be made than can be thus readily obtained, the state will do well to let the field lie fallow.

The Salem school is an utterly hopeless affair, for which no word can be said. Portland may conceivably some day maintain a distant department of the state university. Until, however, the financial strength of the state university permits it to develop there a school equal, for instance, to that which the University of Texas supports at Galveston, it has no right to allow a group of local doctors to exploit its name in the conduct of a low-grade proprietary institution. That out of its own slender revenues it should divert a thousand dollars annually into the coffers of this concern is well-nigh incredible.

¹ Not estimated by U. S. Census Bureau.

PENNSYLVANIA

Population, 7,032,915. Number of physicians, 11,056. Ratio, 1: 636.

Number of medical schools, 8, *plus* 1 postgraduate school.

PHILADELPHIA: *Population*, 1,540,430.

(1) UNIVERSITY OF PENNSYLVANIA DEPARTMENT OF MEDICINE. Organized 1765. An organic part of the university.

Entrance requirement: One year of college work, in which, however, conditions have been very freely allowed.

Attendance: 546, 63 per cent from Pennsylvania.

Teaching staff: 157, of whom 26 are professors, 131 of other grade. The laboratory instructors, with a few of their assistants, devote their entire time to teaching and research.

Resources available for maintenance: The department shares the general funds of the university. Its budget—exclusive of the hospital and dispensary—is \$131,255; the income from fees is \$104,612.

Laboratory facilities: Five separate well equipped buildings are provided for the laboratories of the department: the first for histology, embryology, etc.; the second—new and admirably adapted to its purposes—for pathology, physiology, and pharmacology; the third for chemistry and anatomy, with a deservedly famous anatomical museum; the fourth for hygiene; the fifth is the clinical laboratory, never as yet adequately supported. Near by is the Wistar Institute, open to graduate students for research in anatomy. The department possesses an admirable library. Its scientific faculty has been recently strengthened by the creation of chairs of physiological chemistry and experimental medicine, specially endowed. The department has, therefore, an admirable material equipment.

Clinical facilities: The University Hospital of 350 beds, of which 280 are available for instruction, is contiguous to the laboratories. There is a separate maternity pavilion of 50 beds. Considerable use is also made of several other hospitals, notably the Philadelphia General Hospital and the Pennsylvania Hospital, extramural instruction being given at the latter. The recently established Phipps Institute for tuberculosis is also now part of the clinical plant. The equipment of the department thus fully satisfies all essential conditions.

Two dispensaries are used, one at, the other at a distance from, the university. Abundant material is thus obtained.

Date of visit: March, 1909.

(2) **JEFFERSON MEDICAL COLLEGE.** Organized 1825. An independent institution.

Entrance requirement: A high school education or its equivalent. Of all independent schools outside New York state, this institution comes nearest to obtaining its published entrance requirements. It lacks, however, an organization adapted to the evaluation of secondary school credentials. A fair percentage of those admitted have had some college work.

Attendance: 591, of whom 57 per cent are from Pennsylvania.

Teaching staff: 122, of whom 22 are professors, 100 of other grade. Seven instructors devote their entire time to the school.

Resources available for maintenance: Fees only, amounting to \$102,995. Part of the school income is, however, diverted in order to pay off building mortgages. The hospital has independent sources of support.

Laboratory facilities: An attractive building contains separate laboratories for anatomy, physiology, chemistry, pathology, histology, bacteriology, and pharmacy. The equipment is in general modern and adequate to the needs of undergraduate instruction; in certain departments, *e. g.*, anatomy and bacteriology, additional activity is in progress. Lack of space and means restricts the school to undergraduate teaching. There are an attractive library, museum, and other teaching accessories.

Clinical facilities: The Jefferson Hospital—a modern structure, with 223 teaching beds, belonging to the institution—adjoins the laboratory building; it is connected with a dispensary which supplies an abundance of material. The maternity department, with 17 beds, occupies a separate building. Students are freely admitted to the hospital wards and its clinical laboratory.

The plant of the institution is therefore modern and compact.

Date of visit: March, 1909.

(3) **MEDICO-CHIRURGICAL COLLEGE OF PHILADELPHIA.** Organized 1881. An independent school.

Entrance requirement: Less than a four-year high school education.

Attendance: 480, 82 per cent from Pennsylvania.

Teaching staff: 109, of whom 23 are professors, 86 of other grade. No teachers devote their entire time to medical instruction; three teachers, however, devote themselves entirely to the school, if the dental and pharmacy departments are counted in.

Resources available for maintenance: Fees, amounting to \$48,281.

Laboratory facilities: Well equipped for ordinary undergraduate teaching are the laboratories of physiology, chemistry, pathology, and bacteriology. Anatomy is practically limited to dissecting, with some drawing and modeling, the professor

being a practitioner. There is no museum beyond necessary specimens for pathological work. There is a library at the College Club. Students in dentistry, pharmacy, and medicine mingle in a number of classes. Student assistants are freely used. Except in bacteriology, little or no effort is made to cultivate original scientific activity; great stress is laid on effective drill.

Clinical facilities: The school has entire control of its own hospital, of 180 available beds, which is in close proximity to the other buildings. The Maternity Hospital is near by. Ward and section methods are in use. Classes are also held in the usual manner at other hospitals.

The dispensary attendance is large.

Date of visit: March, 1909.

(4) TEMPLE UNIVERSITY, DEPARTMENT OF MEDICINE. Organized 1901.

Entrance requirement: Less than a four-year high school education.

Attendance: 186.

Teaching staff: 85, of whom 15 are professors, 70 of other grade. There are no full-time teachers.

Resources available for maintenance: Fees only, amounting to \$17,000 (estimated).

Laboratory facilities: These are entirely inadequate and in some departments quite wretched. There is an ordinary elementary laboratory for chemistry; a single room with slight equipment for histology, pathology, and bacteriology, and only a demonstration outfit for physiology. The dissecting-room is in bad condition. There is a small museum and a library of several thousand volumes of miscellaneous character, but no other teaching accessories. Dental, pharmacy, and medical students mingle in the same classes.

Clinical facilities: The school has access to two small hospitals, whose work is almost four-fifths surgical. The dispensary has a large attendance.

Date of visit: March, 1909.

(5) HAHNEMANN MEDICAL COLLEGE AND HOSPITAL. Organized 1848. An independent institution.

Entrance requirement: Less than a four-year high school education,—probably much less, for most of the credentials were passed on by the secretary.

Attendance: 182, 61 per cent from Pennsylvania.

Teaching staff: 72, of whom 27 are professors, 45 of other grade. One teacher devotes his entire time to the school.

Resources available for maintenance: Fees, amounting to \$18,500.

Laboratory facilities: The school possesses an ordinary laboratory for general chemistry; a second, with slight equipment, for histology and physiology; and another, fairly equipped, for pathology and bacteriology. The dissecting-room is clean and odorless. Both regular and homeopathic pharmacy are taught. There is a large and very well kept museum.

Clinical facilities: The school is connected with the Hahnemann Hospital, containing some 150 beds; but no ward clinics are held. Patients are wheeled into the amphitheater. Students have no access to the clinical laboratory.

The dispensary has a large attendance, and there only, for the most, the student comes into close contact with patients.

Date of visit: March, 1909.

(6) WOMAN'S MEDICAL COLLEGE OF PENNSYLVANIA. Organized 1850. An independent institution.

Entrance requirement: A high school education or its equivalent.

Attendance: 125.

Teaching staff: 52, of whom 25 are professors, 27 of other grade. One teacher devotes entire time to the schools; several others teach laboratory subjects elsewhere as well.

Resources available for maintenance: Fees, amounting to \$15,480, and income from endowments, amounting to \$13,820.

Laboratory facilities: Simply, but intelligently, equipped and conscientiously used laboratories are provided for physiology, bacteriology and pathology, histology and embryology, chemistry, pharmacy, and anatomy. There is striking evidence of a genuine effort to do the best possible with limited resources. There are a useful library and a good museum.

Clinical facilities: The school is now building a new hospital, part of which is already in use. This, with a temporary building, accommodates 27 beds. There is, besides a maternity of 16 beds, and an out-patient obstetrical service. Ward work, with assignment of individual cases, is regularly carried on. Supplementary opportunities are obtained at several other institutions. There is a fair dispensary service.

Date of visit: March, 1909.

(7) PHILADELPHIA COLLEGE AND INFIRMARY OF OSTEOPATHY. Established 1898. An independent institution.

Entrance requirement: Nominal.

Attendance: 126.

Teaching staff: 18, of whom 11 are professors, 7 of other grade.

Resources available for maintenance: Fees, amounting to \$18,900 (estimated).

Laboratory facilities: These are utterly wretched. They comprise a laboratory for histology, in which a small centrifuge is the only visible object of interest; a small laboratory for elementary chemistry in a dark cellar; and an intolerably foul dissecting-room in a dark building, once a stable. If there is any provision for pathology, physiology, or bacteriology, any books, or museum, or other teaching accessories except a few crude drawings, a model, and a skeleton, all was successfully concealed. Three separate class-rooms are provided,—containing necessary furniture only.

Clinical facilities: The infirmary, the address of which is not given in the catalogue, is some blocks distant; it contains three beds and has, it is claimed, 200 patients who come twice or thrice weekly for treatment. The catalogue announces that its students have the “privilege of witnessing operations at the University Hospital, Jefferson Hospital, etc.” This is not the case. These students are intruders, without rights or privileges of any description whatsoever.

Date of visit: January, 1910.

PITTSBURGH: *Population*, 570,065.

(8) UNIVERSITY OF PITTSBURGH, MEDICAL DEPARTMENT. Organized 1886; affiliated with the University of Pittsburgh in 1892, it became an organic department thereof in 1909.

Entrance requirement: Four-year high school education or its equivalent.

Attendance: 315.

Teaching staff: 103, of whom 48 are professors, 60 of other grade. Five instructors give their entire time to the school. There is one research assistant.

Resources available for maintenance: Fees, amounting to \$48,500.

Laboratory facilities: The school has within a year undergone a complete transformation. A more thorough piece of house-cleaning within so short a period is hardly credible. A year ago, before the University of Pittsburgh obtained control, the so-called laboratories were dirty and disorderly beyond description. Since the present management took hold last fall, the admission of students has been much more carefully supervised; the building has been put in excellent condition; laboratories for chemistry, physiology, bacteriology, and pathology have been remodeled and equipped with modern apparatus for both teaching and research; foreign and domestic periodicals have been subscribed for; a study-room in good order has been instituted in place of the lounging-room where last year “four dozen wooden chairs were broken.” Whole-time instructors of modern training and ideals have been secured. This is the more remarkable, as only fees have been available. Despite the necessary defects of schools relying wholly on fees, the experience of this

institution confirms our contention that the conscientious and intelligent use of fees would alone greatly improve existing conditions in most schools.

A new building is in process of erection.

Clinical facilities: The school has access to several hospitals in which an abundance of material is available, subject, however, to the usual limitations. The clinical instruction is therefore here, as generally elsewhere, put together of disconnected parts. This does not, however, apply to obstetrics; for the school controls a maternity hospital of 34 beds, which, quite slovenly a year ago, has also been transformed in the last few months. It is neat, clean, well managed, and has been improved by the addition of a new delivery-room, sterilizing outfit, etc. It is in charge of a resident obstetrician of modern training.

The dispensary has been similarly reorganized. A permanent nurse has been installed. Records are now in order; the rooms and equipment are attractive and, in the main, adequate.

Date of visit: February, 1910.

(9) THE PHILADELPHIA POLYCLINIC. A postgraduate independent school.

Entrance requirement: The M.D. degree.

Attendance: Short courses, ranging from six weeks to six months in length, are given, the attendance varying from time to time. The annual attendance is perhaps 150.

Teaching staff: 129, of whom 29 are professors, 100 of other grade.

Resources available for maintenance: Fees and donations.

Laboratory facilities: The school has what no other postgraduate school in the country possesses,—a laboratory building in which its classes in clinical microscopy, operative surgery, etc., are conducted. The instruction is of a practical character, aiming to meet the needs of physicians whose training has been defective. No animals are used and no active research is in progress. There are few books and periodicals in reach.

Clinical facilities: The Polyclinic Hospital, an excellently conducted institution, contains 81 beds available for teaching purposes. Ward classes receive demonstrative instruction.

The present dispensary consists of a suite of rooms quite inadequate to the amount of material to be handled. A new building is in process of erection.

Date of visit: February, 1910.

General Considerations

MEDICAL education in the state of Pennsylvania presents no unusual problems from the standpoint of theory. It is easy enough to decide what ought to happen. From a practical point of view, however, the situation is exceedingly difficult. The medical schools

are in some respects strong institutions; moreover, education, philanthropy, and politics have become so interwoven that they make a combination too intricate to be readily dissolved.

The state is without an educational system; and the legislature has recently refused to pass a bill aiming to organize the common, secondary, and normal schools of the state. Ordinary educational values are therefore still obscure and confused. Though the last legislature improved the law regulating medical education to the extent of making a four-year high school course or its equivalent the legal minimum, the educational disorganization of the state makes its enforcement problematical.

There is still another source of apprehension on this score. The real standard depends on who evaluates the "equivalent." The agents to whom this function has been officially delegated in the past have conceded much to the wishes—real or supposed—of the schools. The Pittsburgh representative has been extremely lax; his "equivalent" to the four-year high school education has not been equal to a two-year high school education. The present incumbent at Philadelphia is newly appointed; conditions described in the text refer to previous years. Finally, some of the schools have been using their own judgment in dealing with credentials, referring only such as they did not accept themselves. It is impossible to ascertain how those referred were distinguished from those accepted in the medical school office.

If, now, a genuine four-year high school standard is enforced, out of the eight undergraduate schools in the state only two will avoid very serious damage: the University of Pennsylvania and the Jefferson Medical College, the former already beyond the standard in question, the latter probably strong enough to stand the shrinkage which would result,—for a large part of its enrolment now meets the requirement. The University of Pittsburgh is fully alive to the necessity of procuring endowment in order to meet the inevitable deficit, and will stand or fall on that issue. The other five schools have no future; their enrolment is so largely the make-believe equivalent that enforcement of a real four-year high school standard will seriously threaten their existence even at their present level of efficiency; progress would be altogether impossible.

The situation so far simplified by an actual entrance standard, another topic presses for consideration. The state of Pennsylvania has for years been engaged in distributing large sums to private and semi-private charities. These largesses have enabled several of the Philadelphia schools to build and partly to maintain their own hospitals. That this policy is thoroughly objectionable and demoralizing is beyond dispute. The state has neither right nor business to make presents to private corporations that it can neither regulate nor control. And the level of civic life in Pennsylvania has been greatly lowered by the log-rolling and favoritism that the possibilities of "pull" have created. One would be perhaps not over-sanguine to expect that the bounty and subsidy system will one day be replaced by strict payment for services rendered,—so strict, that the hospitals will, as in New York, lose rather than gain

by the operation. The unendowed medical schools of the state cannot survive such a wholesome treatment of the state's philanthropic obligations. The extension of their hospitals would be prohibited; even their maintenance would be imperiled.

It is thus clear that a reasonable—not a high—standard of admission and a righteous public policy in dealing with charities would soon reduce the schools of the state to two,—the University of Pittsburgh, provided it secures endowment, and the University of Pennsylvania, whose resources available for medical education would also require to be increased. Fortunate indeed would it be, if broad views might bring about this increase in part through consolidation of the three large schools of Philadelphia, one or two of the three being liquidated as a means of liberating a considerable sum, applicable thenceforth to the development of the single surviving school. Into such a scheme—inevitable, in any case, unless the independent schools accomplish the heretofore impossible task of procuring endowment—the Polyclinic would easily fall. The day of independent and elementary postgraduate instruction is rapidly passing; the postgraduate school of the future will crown a substantial undergraduate school of medicine. The outcome here suggested can be averted only if the independent schools secure endowment,—for which there is no precedent in America,—or if some university outside Philadelphia form an alliance there. There is just now no academic institution in the state whose resources would warrant this step. Whatever these medical schools now offer, they would, singly or combined, shortly prove a drain on any university endeavoring to apply to medicine the standards and ideals cultivated in its other departments. Moreover, as two schools—one at Pittsburgh, the other at Philadelphia—can supply the state with physicians, no other university is justified in entering the field unless its resources, free to be applied to medicine, are sufficient to insure as a consequence a real advance in medical knowledge and practice.

SOUTH CAROLINA

Population, 1,510,566. Number of physicians, 1141. Ratio 1: 1324.¹

Number of medical schools, 1.

CHARLESTON: *Population*, 56,659.

MEDICAL COLLEGE OF THE STATE OF SOUTH CAROLINA. Founded 1823. An independent institution.

Entrance requirement: Nominal.

Attendance: 213.

Teaching staff: 34, of whom 11 are professors, 23 of other grade. There are no whole-time teachers.

¹ Polk's statistics make the ratio 1: 1168.

Resources available for maintenance: Fees, amounting to \$19,447 (estimated).

Laboratory facilities: Comprise very meager equipment for elementary chemistry, pharmacy, and anatomy—the dissecting-room in bad condition. The instructor in pathology and bacteriology has a fair private laboratory, to which students have no access; student work in those subjects is mostly confined to looking through the microscope at slides that he prepares. There is no museum, except old papier-mâché and wax models, no library, except some antiquated publications. It is without other teaching aids.

Clinical facilities: The school has access to the Roper Hospital, an unusually attractive institution of about 200 beds a mile distant. There were 80 patients at the time of the visit. Complaint is made that it is difficult to induce graduates to serve as internes. Obstetrical work is rare.

There is no school or other organized dispensary.

Date of visit: February, 1909.

SOUTH DAKOTA

Population, 498,077. Number of physicians, 607. Ratio, 1: 821.

Number of medical schools, 1.

VERMILION: *Population*, 2188.

UNIVERSITY OF SOUTH DAKOTA COLLEGE OF MEDICINE. Organized 1907. A half-school.
An organic department of the state university.

Entrance requirement: 2 years of college work.

Attendance: 7.

Teaching staff: 5 professors and 5 instructors, who take part in the work of the department.

Resources available for maintenance: The department shares in the general funds of the university. No separate budget is prepared. Fees amount to \$660.

Laboratory facilities: The necessary equipment is at hand for painstaking routine instruction in the laboratory branches. A library and museum have been started.

Date of visit: November, 1909.

General Considerations

THE two Dakotas have taken time by the forelock: before any vested proprietary interest could be created, they have fixed the state practice requirement at two years of college work, thus fortifying the medical department of the state university. The state, though thinly settled, is prosperous, and no anxiety is felt that the high stan-

ard will deplete the medical profession of the state. On the contrary, it has been adopted as a means of protecting a people already supporting twice as many doctors as it needs.

Though the students are few, the present provision for their teachers is on too unpretentious a scale. Unfortunately, like all the western states, South Dakota is already scattering its financial resources among half a dozen competing state institutions. Of its seven tax-supported institutions of higher grade, three give the A.B. degree and the others desire to do so. It will prove decidedly unfortunate if these institutions are not in their infancy coördinated, so as to form a genuine system rather than a number of separate, warring units. A population of half a million in a new country will do well to sustain one substantial state college with departments of law, medicine, etc. It can do that only by concentrating its outlay.

TENNESSEE

Population, 2,248,404. Number of physicians, 3803. Ratio, 1: 681.

Number of medical schools, 9.

CHATTANOOGA: *Population, 34,773.*

(1) CHATTANOOGA MEDICAL COLLEGE. Organized 1889. The medical department of the University of Chattanooga.

Entrance requirement: Nominal.

Attendance: 112.

Teaching staff: 25, of whom 11 are professors, 14 of other grade.

Resources available for maintenance: Fees, amounting to \$4290.

Laboratory facilities: The school occupies a small building, externally attractive; the interior, dirty and disorderly, is almost bare, except for a fair chemical laboratory in good condition. The dissecting-room contains two tables; the single room assigned to histology, pathology, and bacteriology contains a few old specimens, mostly unlabeled, and one oil-immersion microscope. The instructor explained that they "study only non-pathogenic microbes; students do not handle the pathogenic." There is nothing further in the way of laboratory outfit; no museum, books, charts, models, etc.

Clinical facilities: Amphitheater clinics are held at the Erlanger Hospital, which averages about 50 free patients. Students may not enter the wards. Perhaps ten obstetrical cases annually are obtainable, students being "summoned,"—just how is not clear. The students see no post-mortems, no contagious diseases, do no blood

or urine work, and do not always own their own text-books. They use quiz-compendis instead.

There is no dispensary.

This is a typical example of the schools that claim to exist for the sake of the poor boy and the back country.

Date of visit: January, 1909.

KNOXVILLE: Population, 38,328.

(2) **TENNESSEE MEDICAL COLLEGE.** Organized 1889. A stock company; nominally the medical department of Lincoln Memorial University.

Entrance requirement: Nominal.

Attendance: 82, 70 per cent from Tennessee.

Teaching staff: 31, of whom 26 are professors, 5 of other grade.

Resources available for maintenance: Fees, amounting to \$4994.

Laboratory facilities: The school building is externally attractive; within, dirty. In the basement is a small laboratory for inorganic chemistry. A few microscopes, a microtome, and some sterilizing apparatus—no cultures or pathological specimens were visible—constitute the laboratory for pathology, bacteriology, and histology. The dissecting-room is ordinary; there are no books, museum, charts, etc.

Clinical facilities: The school adjoins a neat hospital, recently constructed, which proves, however, to be simply the private hospital of the faculty for which student fees help to pay. It has an average of 40 patients, with no free wards. Five clinics weekly are scheduled, but it is admitted that "they are not always held." Practically, students "are called" when a case happens along which the doctor can arrange to have them see. Obstetrical instruction is limited "to a few deliveries before the class."

There is no dispensary.

Date of visit: January, 1909.

(3) **KNOXVILLE MEDICAL COLLEGE.** Colored. Established 1900. An independent institution.

Entrance requirement: Nominal.

Attendance: 23.

Teaching staff: 11, of whom 9 are professors.

Resources available for maintenance: Fees, amounting to \$1020 (estimated).

Laboratory facilities: None. The school occupies a floor above an undertaker's establishment.

Clinical facilities: None. It was stated by a student that twice between October 1 and January 28 "a few students were taken to the Knoxville College Hospital."

There is no dispensary.

The catalogue of this school is a tissue of misrepresentations from cover to cover.

Date of visit: January, 1909.

MEMPHIS: *Population,* 140,145.

(4) **COLLEGE OF PHYSICIANS AND SURGEONS.** Organized 1906. A stock company, now calling itself the medical department of the University of Memphis, a fictitious affair.

Entrance requirement: None. "Accept students and try them out."

Attendance: 77.

Teaching staff: 47, of whom 22 are professors, 25 of other grade.

Resources available for maintenance: Fees, amounting to \$7400 (estimated).

Laboratory facilities: The school occupies an excellent building, recently erected, fees being largely consumed in helping to pay for it. The dissecting-room is of modern design, consisting of small rooms with hot and cold water; but the work was conducted on antiquated lines, cadavers being in wretched condition. The chemical laboratory is good and quite adequate to instruction in elementary chemistry. Equipment for pathology and bacteriology is less than fair; for physiology, practically nothing. There are few books, no museum, charts, etc.

Clinical facilities: The schedule shows seven one-hour clinics (5 in surgery, 2 in medicine) per week at the City Hospital during one-half of the school year. At the date of the visit, perhaps 40 beds were thus accessible. Students "look on" at the obstetrical cases.

A suite of rooms in the college building is set aside for a dispensary.

Date of visit: November, 1909.

(5) **MEMPHIS HOSPITAL MEDICAL COLLEGE.** Organized 1880. A stock company.

Entrance requirement: Nominal.

Attendance: 442.

Teaching staff: 35, of whom 12 are professors, 23 of other grade.

Resources available for maintenance: Fees, amounting to \$34,600 (estimated). The condition of the school laboratories shows what becomes of this sum.

Laboratory facilities: The school occupies an excellent building, heavily mortgaged. It is new and well kept. The chemical laboratory is good and adequate to elementary chemistry. An excellent room is assigned to dissecting, but the cadavers

are putrid. One laboratory, with slight equipment and little material, answers for all microscopic work. It is obvious that large classes have paid in considerable sums that have been used to pay for an expensive building, not to provide even fair teaching facilities. The course of instruction is not graded.

Clinical facilities: The schedule shows nine one-hour clinics a week at the City Hospital, where the available material is divided between the two schools. At the date of the visit, perhaps 40 beds were thus accessible to each. Students "look on" at the obstetrical cases. The course of instruction is not graded; the amount of material is absurdly inadequate for the huge classes.

There is a dispensary in the school building. Its equipment is slight; there are no systematic records. The amount of material cannot possibly suffice for the student body; and there is nothing to indicate effective use, as far as it goes.

Date of visit: November, 1909.

(6) UNIVERSITY OF WEST TENNESSEE, MEDICAL DEPARTMENT. Colored. Organized 1900.

Entrance requirement: Nominal.

Attendance: 40.

Teaching staff: 14, all of whom are professors.

Resources available for maintenance: Fees, amounting to \$2000 (estimated).

Laboratory facilities: There is meager equipment for chemistry, pharmacy, and microscopy. Otherwise the rooms are bare.

Clinical facilities: The students have access to eight or ten beds, twice weekly, in a small hospital close by.

There is a dispensary, without records, in the school building.

Date of visit: November, 1909.

NASHVILLE: *Population*, 107,076.

(7) VANDERBILT UNIVERSITY MEDICAL DEPARTMENT. Established 1874. An organic department of the university.

Entrance requirement: Less than high school graduation, though a fair proportion of the students have had some college work.

Attendance: 200.

Teaching staff: 40, of whom 17 are professors, 23 of other grade. The dean of the school is the professor of chemistry in the academic department—an undesirable arrangement at a time when medical education is so rapidly changing form. No instructor devotes entire time to the medical department.

Resources available for maintenance: Fees, amounting to \$26,250. This sum, adequate to provide fair laboratory instruction, is not devoted to education alone. The medical department, although organically part of the university, is under contract to wipe out with its fees the cost of the building it occupies, and meanwhile it pays the university interest at six per cent on the unpaid balance.

Laboratory facilities: The school possesses satisfactory laboratories for pathology, bacteriology, and histology, and an energetic instructor has charge of them. A creditable beginning has been made in experimental physiology. Chemistry is well provided by the university. Anatomy is bad—the work being conducted on antiquated lines in a foul dissecting-room. There is a useful museum and a fair library.

Clinical facilities: The school has converted the basement of its own building into a ward of 35 beds; and has access to the City Hospital (65 beds) besides. The amount of material thus available is too restricted.

There is a dispensary with a fair attendance.

Date of visit: January, 1909.

(8) UNIVERSITIES OF NASHVILLE AND TENNESSEE MEDICAL DEPARTMENT. A combination under limited contract, formed in 1909, expiring 1912. One of the two institutions represented is the State University of Tennessee (Knoxville), the other the University of Nashville,—a university in name only.

Entrance requirement: Less than high school graduation.

Attendance: 207.

Teaching staff: 55, of whom 26 are professors, 29 of other grade. The distribution of chairs is significant: there are four professors of medicine, four professors of surgery (not including gynecology), and one whole-time teacher.

Resources available for maintenance: Fees, amounting to \$26,000 (estimated), and subscriptions from the two universities, amounting to \$8100 in cash. Of the two universities, the University of Tennessee is supported by legislative appropriation; the University of Nashville has an endowment of \$60,000, yielding \$3600 annually.

Laboratory facilities: These comprise a poor laboratory for elementary chemistry, an outfit, in part new, for bacteriology, pathology, histology, and physiology, and a poorly kept dissecting-room. There is a small museum.

Clinical facilities: The building formerly used by the medical department of the University of Tennessee has been converted into a hospital with a capacity of 70 beds. In view of the brief period that has elapsed since the merger, this improvement in clinical resources is most commendable, for the hospital is completely controlled by the school. The school has access to the City Hospital besides.

The first floor of the college hospital building is used as a dispensary. Though its equipment is still slight, it represents a great advance over the conditions that preceded.

Date of visit: January, 1909.

(9) MEHARRY MEDICAL COLLEGE. Colored. Organized 1876. The medical department of Walden University.

Entrance requirement: Less than a four-year high school education.

Attendance: 275.

Teaching staff: 26, of whom 12 are professors, 14 of other grade.

Resources available for maintenance: \$23,946, representing income from endowment of \$35,000, subscription from the Freedman's Aid Society, and fees, the last item being \$20,310.

Laboratory facilities: The school possesses fair laboratories for chemistry and physiology and highly creditable laboratories for bacteriology, histology, and pathology, the outfit including animals, microscopes, microtome, and pathological material in excellent order. A separate frame building, well kept, is devoted to anatomy. The equipment and general conditions reflect great credit on the zeal and intelligence of those in charge of the school and its several departments.

Clinical facilities: These are restricted. The school has access to Mercy Hospital, 32 beds.

Date of visit: January, 1909.

General Considerations

THE state of Tennessee protects at this date more low-grade medical schools than any other southern state. It would be unfair and futile to criticize this situation without full recognition of local conditions. A standpoint that is entirely in order in dealing with Cincinnati, Chicago, or St. Louis is here irrelevant. The ideals held up must indeed be the same; but their attainment is much further in the future. The amount of money available for medical education is small; the preliminary requirement must be relatively low. Practically all that can be asked of Tennessee is that it should do the best possible under the circumstances.

This it does not do. The six white schools value their separate survival beyond all other considerations. A single school could furnish all the doctors the state needs and do something to supply the needs of adjoining states as well. Low as the entrance standard must be, it has been made lower in order to gather in students for six schools where one would suffice. The medical schools solicit and accept students who have not yet made the best of the limited educational opportunities their homes provide; and to this extent, not only injure the public health, but depress and demoralize the general educational situation.

The same is true in reference to laboratories and clinics. However small the sums applicable to building and equipping laboratories, conditions are needlessly aggravated when six plants are equipped instead of one. Fees that ought now to be used in providing better teaching are still paying for expensive buildings in Memphis and Nashville. The city hospitals of both places, small at best, are divided between two schools, though they do not furnish enough material for one.

Those who deal with medical education in Tennessee are therefore making the worst, not the best, of their limited possibilities. Their medical schools, treated on their merits, would speedily reduce to one: the utterly wretched establishments at Chattanooga and Knoxville would be wiped out; the more showy, but quite mercenary, concerns at Memphis would be liquidated. The University of Tennessee, with an annual income that does not as yet suffice for the legitimate needs of its own plant at Knoxville, should abandon for the present the effort to develop at Nashville a school that it can neither control nor support. The time may come when there will be a call for the state university to enter the field. But that time is not now. For the present it is dividing its own forces and hindering the most effective use of such resources as Nashville affords. The whole field is strangely confused: Lincoln Memorial University (which is an industrial school, not a university) at Cumberland Gap shelters a medical school at Knoxville; the University of Tennessee at Knoxville shelters an entirely superfluous school at Nashville.

If our analysis is correct, the institution to which the responsibility for medical education in Tennessee should just now be left is Vanderbilt University; for it is the only institution in position at this juncture to deal with the subject effectively. This does not mean that Vanderbilt has now any large sums of money available or that it should inaugurate impossible entrance standards. It can do neither, for the general situation countenances neither. The suggestion merely recognizes the facts that one school can do the work; that Vanderbilt occupies in Nashville the point of vantage; that, in the public interest, the field should be left to the institution best situated to handle it.

On the other hand, any such arrangement imposes upon Vanderbilt a very distinct responsibility. It would have to nurse its enrolment: having determined just how large a school local needs require, it must fix and enforce the strictest entrance requirement compatible therewith. At the present time this standard would be less than four-year high school graduation; but whatever it be, if only it is real and definite, it will operate to brace up general conditions. Improved teaching should compensate student defects. To this end, every effort should be made to secure endowment specifically applicable to the medical department; in the interval, fees must be employed not to wipe out old obligations, however incurred, but to improve the school. The contract between Vanderbilt University and its medical department should be canceled. The practitioner teachers must make good their ambition to advance medical education by being content with the indirect advantage accruing from school connections. If

the entire fee income is used to equip the laboratories, to employ full-time teachers in the fundamental branches, to fit out and organize a good dispensary, there will still remain defects and makeshifts enough; but the school will wear a different aspect than is presented by any institution in the state to-day.

Let it be said ungrudgingly that these suggestions are offered in no spirit of unkindness. The State University and Vanderbilt have had their hands full. They have worked valiantly amidst conditions that might well appal the strongest hearts. They deserve no blame for the past, provided only they unselfishly and vigorously coöperate in forgetting it. In the last few years right courses of action in medical education have for the first time been defined. A decade hence it will be fair to look back and ask whether the universities of the state have followed them.

Of the three negro schools in the state, two are without merit. The third—Me-harry—is a most creditable institution. The reader is referred to chapter xiv, "The Medical Education of the Negro," for a fuller discussion of its needs and deserts.

TEXAS

Population, 3,780,574. Number of physicians, 5789. Ratio, 1:653.

Number of medical schools, 4.

DALLAS: *Population*, 56,119.

(1) BAYLOR UNIVERSITY COLLEGE OF MEDICINE. Organized 1900. Since 1903 the medical department of Baylor University.

Entrance requirement: Nominally a three-year high school course or its equivalent.

Attendance: 53.

Teaching staff: 29, of whom 16 are professors, 13 of other grade. All the teachers are practitioners.

Resources available for maintenance: Fees, amounting to \$7735 (estimated). The school has not thus far been assisted by the university.

Laboratory facilities: The school possesses a new laboratory adjoining the hospital to be noticed below; but at the date of the visit it was still quite bare. The dissecting-room was in good condition; a fair chemical laboratory and a meagerly equipped laboratory for pathology and bacteriology had been installed. There was nothing else, and no assurance of funds with which to provide additional laboratories or to maintain those already in part provided.

Clinical facilities: Adjoining the laboratory building is a new hospital of some 200 beds, in which the school has access to two free wards containing 32 beds, and to

an additional negro ward of 22 beds in a pavilion close by. There is no clinical laboratory. Clinical opportunities are obtained at two other institutions, but no infectious diseases and little obstetrical work are obtainable. The clinical opportunities are thus decidedly inadequate.

A dispensary is just beginning.

Date of visit: November, 1909.

(2) **SOUTHWESTERN UNIVERSITY MEDICAL COLLEGE.** Organized 1903. Nominally the medical department of Southwestern University, which is protected by contract against liability for its debts.

Entrance requirement: Nominally a three-year high school course or its equivalent.

Attendance: 68.

Teaching staff: 32, of whom 17 are professors, 15 of other grade. All are practitioners.

Resources available for maintenance: Fees only, amounting to \$7150 (estimated).

Laboratory facilities: The school possesses a new building, externally attractive but wretchedly kept. It contains a disorderly and incomplete chemical laboratory, a small amount of new physiological apparatus, a single laboratory fairly well equipped for pathology and bacteriology, and an ordinary dissecting-room. There is a "reading-room" with nothing to read. The lecture-rooms are bare, except for chairs; in a corner of one of them is an abused manikin.

Clinical facilities: Amphitheater clinics in surgery are held once weekly at an institution across the street, where perhaps 50 beds, mostly surgical, are accessible, and one afternoon a week at the City Hospital, one and a half miles distant. No infectious diseases are obtainable. Neither hospital contains a clinical laboratory. Clinical opportunities are therefore decidedly inadequate.

A dispensary is just starting.

Date of visit: November, 1909.

FORT WORTH: *Population, 27,096.*¹

(3) **FORT WORTH UNIVERSITY MEDICAL DEPARTMENT.** Organized 1894. A nominal department of a local "university."

Entrance requirement: Nominally a three-year high school course or its equivalent.

Attendance: 100.

Teaching staff: 47, of whom 14 are professors, 33 of other grade. All are practitioners.

Resources available for maintenance: Fees only, amounting to \$10,500 (estimated).

Laboratory facilities: These comprise a dissecting-room, ordinary laboratories for

¹Not estimated by U. S. Census Bureau.

chemistry and bacteriology, and a single laboratory with routine outfit for pathology and histology; recent provision on a small scale has been made for physiology. The class-rooms are bare except for a reflectoscope and a defective skeleton. There are a small museum of unlabeled specimens and a small library.

Clinical facilities: The basement of the school building makes a wretched hospital of 50 beds, 20 of them free. There is no clinical laboratory. One surgical clinic weekly is held at a private hospital two miles distant.

For the dispensary a fair attendance is claimed, but no complete index is kept.

Date of visit: November, 1909.

GALVESTON: *Population, 37,834.*

(4) **UNIVERSITY OF TEXAS, DEPARTMENT OF MEDICINE.** Organized 1891. An organic department of the state university.

Entrance requirement: A four-year high school education, passed on by the state university.

Attendance: 206.

Teaching staff: 26, of whom 9 are professors, 17 of other grade. Three professors and seven instructors give entire time to the department. All instructors are on salary.

Resources available for maintenance: The department is carried by the general funds of the university. Its budget calls for \$63,342, of which \$6500 are derived from fees; the hospital budget requires \$39,611 besides.

Laboratory facilities: The school has a complete series of admirable teaching laboratories, covering anatomy, physics, chemistry, physical chemistry, pathology, bacteriology, histology, and embryology. There is a large pathological museum, beautifully kept, every specimen classified, labeled, and indexed; and a notable anatomical museum in which special preparations are most advantageously arranged for teaching use. The library is good and is in regular receipt of foreign and domestic journals; animals in abundance are on hand. Competent helpers are provided for each floor. No effort, however, is made in the direction of research.

Clinical facilities: A university hospital of 155 beds adjoins the laboratories. Its organization is along sound lines—the service with a single chief being continuous, but students have not as yet been actively utilized in the wards. As elevated standards improve the student body, this innovation will become more feasible.

For lack of assistants, the dispensary is not so thoroughly organized. The attendance is fair.

Date of visit: November, 1909.

General Considerations

TEXAS is indubitably a state destined to a great development; its educational institutions must from time to time be readjusted to take account of its expanded needs. It is neither wise nor possible to provide now for requirements that will a generation hence become imperative. Sufficient for the people of Texas to-day to meet in the most effective way possible their own needs.

There is now only one educational institution in the state capable of maintaining a medical school whose graduates deserve the right to practise among its inhabitants; there is only one medical school in the state fit to continue in the work of training physicians. That institution is the state university; the medical school is its department at Galveston. The other three schools are without resources, without ideals, without facilities, though at Baylor the conjunction of hospital and laboratory might be made effective if large sums, specifically applicable to medical education, were at hand,—which is not, however, the case.

There is no indication on the face of things that any of the three inferior schools can live through the dry period to the opportunities of the future. Their enrolment is small; and the state is badly overcrowded with just the kind of doctor that they are engaged in producing. Should the loopholes in the present state standard be stopped up, all three would quickly disappear.

The course of the state university needs to be carefully considered. Whether a college requirement will soon be wise is a question to be pondered. The institution has not yet exhausted the possibilities of the high school standard; its laboratories—admirable for undergraduate teaching—need further development on the productive side; its hospital must be enlarged; more effective teaching methods can be introduced into it; the dispensary is not yet effective. It is worth asking whether from the four-year high school basis the university will not be wise to get complete control of the field, driving out the low-grade schools, educating the people of the state to regard it as their main source of supplies in the matter of doctors and the active conservator of public health, before endeavoring to push ahead to a higher standard, which may not be so well adapted to local conditions in a relatively new country.

Meanwhile, to the outsider it seems a regrettable mischance that located the medical department away from the university. Were it placed at Austin, it would apparently gain in every way: the town is as large, and various state institutions there would strengthen its clinical opportunities; it would be easier to attract and to hold outsiders in teaching positions; the stimulus of the university would assist the growth of a productive spirit. Whether at Galveston the school will ever be creative is a question; should it become so, isolation increases the liability to slip back into an unproductive groove. Perhaps it is not yet too late for the people of the state to concentrate their state institutions of higher learning in a single plant.

UTAH

313

UTAH

Population, 336,122. Number of physicians, 359. Ratio, 1: 936.

Number of medical schools, 1.

SALT LAKE CITY: *Population, 65,464.*

UNIVERSITY OF UTAH, DEPARTMENT OF MEDICINE. Organized 1906. A half-school. An organic part of the state university.

Entrance requirement: One year of college work.

Attendance: 18.

Teaching staff: 6 professors and 10 of other grade, who take part in the instruction. The professors are all university teachers, of whom 3 give their entire time to medical subjects.

Resources available for maintenance: The department is supported out of the general funds of the university. It costs approximately \$10,000; its income in fees is \$1405.

Laboratory facilities: Laboratories are adequately equipped for the routine instruction of small classes in anatomy, physiology, physiological chemistry, chemistry, histology, pathology, and bacteriology. The spirit is excellent. A few books, scientific journals, charts, etc., are at hand; a museum has been begun. More liberal support, however, is necessary if the department is to justify its high entrance standard.

It is to be hoped that whenever clinical instruction is started in Salt Lake City, it may be only for the purpose of completing the half-course now offered; in that event Utah need never know the proprietary medical school.

Date of visit: April, 1909.

VERMONT

Population, 353,739. Number of physicians, 663. Ratio, 1: 534.

Number of medical schools, 1.

BURLINGTON: *Population, 22,690.*

UNIVERSITY OF VERMONT COLLEGE OF MEDICINE. Organized 1822. Now an organic part of the university.

Entrance requirement: Less than a four-year high school education.

Attendance: 156, 42 per cent from Vermont.

Teaching staff: 33, of whom 18 are professors, 15 of other grade. Thirteen teachers are non-resident, among them the professors of medicine, obstetrics, pediatrics,

physiology, and pathology. Some of the non-resident teachers go to Burlington weekly; others give a concentrated course covering several weeks. The entire teaching staff never meets. There is one full-time teacher,—in the department of anatomy.

Resources available for maintenance: Fees, amounting to \$21,888. The state has lately appropriated \$10,000.

Laboratory facilities: The school has an attractive new laboratory building adequate to routine teaching of anatomy, pathology, histology, bacteriology, physiology, and chemistry. No research is in progress. There is no library, no museum, few teaching accessories, and no animals on the premises.

Clinical facilities: Two hospitals with 200 ward beds are in a limited way available, but the material is predominantly surgical: medical and obstetrical cases are relatively few. Infectious diseases are in the main didactically taught. There is little bedside work, patients being examined by assigned students in a small room and subsequently demonstrated in the amphitheater. The combined Senior and Junior classes attend a majority of the clinics in internal medicine and general surgery.

The dispensary has a small attendance.

Date of visit: May, 1909.

[For general considerations see "New England," p. 224.]

VIRGINIA

Population, 2,032,567. Number of physicians, 2215. Ratio, 1: 918.

Number of medical schools, 3.

CHARLOTTESVILLE: *Population*, 7307.

(1) UNIVERSITY OF VIRGINIA, DEPARTMENT OF MEDICINE. Organized 1827. An organic department of the university.

Entrance requirement: One year of college work in sciences.

Attendance: 89, 53 per cent from Virginia.

Teaching staff: 31 teachers, of whom 12 are professors, 19 of other grade, take part in the work of the department. The laboratory branches are taught by 8 instructors who give their entire time to them.

Resources available for maintenance: The budget of the department calls for \$52,195, including hospital deficit; it is met out of the funds of the university. The income in fees amounts to \$10,060.

Laboratory facilities: Up to three years ago the department was a didactic school.

Since then it has been revolutionized: good teaching laboratories in all necessary branches, with increased provision for research, have been equipped and put in charge of enthusiastic teachers of modern training and ideals. The main present lack is a suitable building and an adequate medical library.

Clinical facilities: The University Hospital of 100 beds (80 of them ward beds) is the laboratory of the clinical teachers.¹ Its relation to the medical school and its organization for teaching purposes leave nothing to be desired. Though the material has not yet reached proper proportions, it is increasing and is skilfully and effectively used to train the student body in the technique and methods of scientific medicine. The surgical side is in this respect more highly organized than the medical.

There is a small dispensary.

Date of visit: February, 1909.

RICHMOND: *Population*, 111,078.

(2) **MEDICAL COLLEGE OF VIRGINIA.** Organized 1838.

Entrance requirement: Less than a four-year high school education. The registration office is most systematically conducted.

Attendance: 206.

Teaching staff: 61, of whom 16 are professors, 45 of other grade. There are no teachers giving their entire time to medical instruction.

Resources available for maintenance: Fees, amounting to \$22,490, and an annual state appropriation of \$5000.

Laboratory facilities: The school occupies an imposing building with ordinary laboratories for pathology, histology, bacteriology, physiology, and chemistry. The dissecting-room is in poor condition. There is a fair museum and an attractive library with some recent books, in charge of a librarian.

Clinical facilities: These are inadequate. Close by is the Memorial Hospital, with about 40 beds available for teaching. Supplementary facilities are enjoyed in the City Hospital and elsewhere.

The dispensary occupies an excellent suite of rooms and has a fair attendance.

Date of visit: February, 1909.

(3) **UNIVERSITY COLLEGE OF MEDICINE.** Organized 1893. An independent institution.

Entrance requirement: Less than a four-year high school education.

Attendance: 121, 63 per cent from Virginia.

¹ A recent gift of \$50,000 is now available for the extension of the hospital.

Teaching staff: 74, of whom 22 are professors, 52 of other grade.

Resources available for maintenance: Fees, amounting to \$14,975.

Laboratory facilities: The school was recently destroyed by fire and now occupies temporary laboratory quarters.

Clinical facilities: These are inadequate. The school adjoins its own hospital, with less than 50 beds available for teaching. Supplementary facilities are enjoyed elsewhere. An out-patient obstetrical service is well organized.

The dispensary has a fair attendance.

Date of visit: February, 1909.

General Considerations

THE destruction by fire of the University College of Medicine at Richmond should precipitate the consolidation of the two independent schools. Separately neither of them can hope greatly to improve its present facilities, which, weak in respect to laboratories and laboratory teaching, are entirely inadequate on the clinical side. Their present hospitals utilized together, though still unsatisfactory, would at any rate be much more nearly adequate than is either hospital taken by itself; and the combined fees would furnish much better laboratory training than either school now gives. A single independent school of the better type might still have in Virginia a brief term of prosperity,—the more so as the medical department of the University of Virginia is on a considerably higher basis.

The rapid improvement of the medical department of the University of Virginia in the last three years is one of the striking phenomena of recent medical school history. The limitations of Charlottesville have been acutely felt; the university is pursuing the course calculated to surmount them. It faces indeed a much greater outlay than it has yet made, for larger clinics in internal medicine and obstetrics must be developed. The alternative of a remote department diminishes difficulty of one kind only to create difficulty of another. A remote department at Norfolk or Richmond would of course command abundant clinical material; but could it preserve university ideals? The present resources of the university are not large enough to stand the strain of such liberal support as a remote department needs if it is to be genuinely productive. The experience of a few years warrants the belief that a clinic in most lines, for a school of 200 students, can be developed at Charlottesville if the university can afford it. Graduating classes of 50 easily suffice for Virginia's demand. At any rate, so much is evident: in Virginia, as elsewhere, the teaching of medicine will fall to the universities; and at this writing, the only institution available is the University of Virginia.

WEST VIRGINIA

Population, 1,135,206. Number of physicians, 1608. Ratio, 1:706.
Number of medical schools, 1.

MORGANTOWN, *Population*, 2779.

WEST VIRGINIA UNIVERSITY COLLEGE OF MEDICINE. Organized 1902. A half-school.
An organic department of the university.

Entrance requirement: A four-year high school education, though applicants not thus qualified are admitted as special students.

Attendance: 18.

Teaching staff: 7 professors, who take part in the instruction offered, two of them giving their entire time to this department.

Resources available for maintenance: The department is carried by the university. Its income in fees is \$1000 (estimated).

Laboratory facilities: The school is fairly equipped to do elementary work in anatomy, chemistry, histology, pathology, and bacteriology; less well in physiology. There is no library, no museum, no charts, no models, or other teaching accessories. The work and interest are limited to routine.

The school has an "affiliation" with the College of Physicians and Surgeons of Baltimore, — an independent institution over which West Virginia University has neither control nor influence. [*See Maryland (2).*]

Date of visit: March, 1909.

WISCONSIN

Population, 2,356,874. Number of physicians, 2518. Ratio, 1:936.
Number of medical schools, 3.

MADISON: *Population*, 28,438.

(1) UNIVERSITY OF WISCONSIN COLLEGE OF MEDICINE. Organized 1907. A half-school.
An organic part of the university.

Entrance requirement: Two years of college work, including sciences, rigidly enforced.

Attendance: 49.

Teaching staff: 23 instructors, who take part in the work of the department, of whom 17 give their entire time to it.

Resources available for maintenance: The department is maintained out of the general funds of the university. Its budget calls for \$40,625.

Laboratory facilities: Though temporarily housed, the laboratories, complete in number, are admirably equipped with respect to both teaching and research. A successful effort has been made to provide facilities worthy of students on a two-year college basis and of teachers deserving opportunities for progressive work. The department lacks only a building which shall bring its parts together.

Date of visit: May, 1909.

MILWAUKEE: *Population, 337,117.*

(2) **MILWAUKEE MEDICAL COLLEGE.** A stock company, organized 1894, and now nominally the medical department of Marquette University.

Entrance requirement: A four-year high school education or its equivalent.

Attendance: 168, 91 per cent from Wisconsin.

Teaching staff: 67, of whom 30 are professors, 37 of other rank.

Resources available for maintenance: Fees only, amounting to \$22,680.

Laboratory facilities: Meager facilities are provided for the teaching of pathology and bacteriology; there is the usual chemical laboratory; anatomy is better than ordinary. Experimental physiology and toxicology are taught at Marquette College near by; the equipment is slight.

Clinical facilities: These are extremely weak. The school adjoins Trinity Hospital, which is practically part of the same corporation. It has 75 beds, largely occupied by pay patients and given up almost wholly to surgery; teaching is limited to amphitheater clinics; weekly clinics are also held at the County Hospital, five miles distant.

An ill equipped dispensary in the college building has an attendance varying from ten to twenty a day. A card index is now kept.

Date of visit: February, 1910.

(3) **WISCONSIN COLLEGE OF PHYSICIANS AND SURGEONS.** Organized 1893. An independent institution, nominally the medical department of Carroll College.

Entrance requirement: A four-year high school education or its equivalent.

Attendance: 60, 85 per cent from Wisconsin.

Teaching staff: 66, of whom 26 are professors, 40 of other grade. No teacher devotes his entire time to the school.

Resources available for maintenance: Fees only, amounting to \$8675 (estimated).

Laboratory facilities: The school occupies an attractive building which contains an

ordinary laboratory for elementary chemistry, another—poor and very disorderly, without animals—for bacteriology; the room given to histology and pathology is clean, contains a small amount of well kept material, and is adequate to routine elementary work. Anatomy is very poor; there is not even a complete skeleton. No other teaching adjuncts are at hand. No provision is made for even demonstrative work in experimental physiology.

Clinical facilities: These are utterly wretched. The school gives amphitheater clinics only, at a Catholic hospital across the street, practically all of whose work is in surgery. Acute medical cases are seen, if at all, twice a week at the County Hospital, five miles off. A neat dispensary, with poor records and with no laboratory or other equipment, adjoins the school building.

Date of visit: February, 1910.

General Considerations

WISCONSIN presents a simple problem: the two Milwaukee schools are without a redeeming feature. It is claimed that the examiner representing the state board enforces a four-year high school standard; but it has been impossible to procure any information at all from this official, though repeated efforts have been made to do so. Neither of the schools meets the most lenient standards in respect to laboratory outfit or teaching; and as for clinical facilities they are hardly more than nominal.

A western state so admirably organized on the educational side, furnishing excellent college opportunities without cost to the student, is surely in position to meet Minnesota and Indiana in the matter of practice standards. The requirement of a year or two of college work as preliminary to practice would quickly leave the medical department of the state university in sole control.

This department has wisely resisted efforts to make of it a divided instead of a half school; nothing worse could ever happen to it than that it should be rounded off with a clinical end at Milwaukee,—made up, perhaps, in part out of the two schools now there. When the time comes for the completion of the department, it must be completed at Madison. The difficulties due to the size and residential character of the town are not insuperable. There is not the least doubt that wise administration can develop on the site of the university a medical school large enough to train the doctors of the state. But its scope will run far beyond this primary duty; for it will inevitably be a producing department. Assuredly, Wisconsin, fortunate beyond almost all other states in the concentration of its higher institutions of learning, will not be guilty of the folly of detaching in whole or part the medical department from the university whose ideals it can share and help to create.

CANADA

ALPHABETICALLY ARRANGED BY PROVINCES

Population, 6,945,228. Number of physicians, 6736. Ratio, 1 : 1030.
Number of medical schools, 8.

MANITOBA

WINNIPEG: *Population*, 150,000.

(1) MANITOBA MEDICAL COLLEGE. Organized 1888. The medical department of the University of Manitoba, the connection being in process of becoming organic.

Entrance requirement: The University Matriculation Examination or its actual equivalent. The medical course covers five years.

Attendance: 115.

Teaching staff: 41, of whom 22 are professors, 19 of other grade.

Resources available for maintenance: Fees, amounting to \$14,000.

Laboratory facilities: Instruction in chemistry, bacteriology, histology, and pathology is competently given by the University of Manitoba. Other branches are carried on by the medical faculty. The equipment is adequate to routine instruction, new, and steadily increasing. There is a beautifully kept collection of several hundred wet specimens. Appearances indicate a conscientious and intelligent employment of such resources as the school has had.

Clinical facilities: The excellent Winnipeg General Hospital of 400 beds adjoins the school. The school faculty is practically the staff of the free wards. The relation between school and hospital is admirable. Students work freely in wards, clinical laboratory, operating-rooms, obstetrical ward, etc.

There is a good dispensary.

Date of visit: May, 1909.

NOVA SCOTIA

HALIFAX (NOVA SCOTIA): *Population*, 45,000 (estimated).

(2) HALIFAX MEDICAL COLLEGE. Organized in 1867. An independent school with a peculiar relationship to Dalhousie University, which provides satisfactorily instruction in chemistry, physics, and biology, during part of the first two years of the five-year course. In respect to all else the medical school is an independent institution, though its students are practically all examined for their degree by Dalhousie University. The university thus furnishes part of the first two years' teaching and is the final examining body; with the intervening years it has nothing to do.

Entrance requirement : On a par with that of Dalhousie University.

Attendance : 63, 90 per cent from Nova Scotia.

Teaching staff : 33, of whom 16 are professors. There are no full-time instructors. (This does not include the instructors in the scientific branches furnished by Dalhousie University.)

Resources available for maintenance : An annual appropriation of \$1200 from the provincial government and fees amounting to about \$5000. Three-fourths of the fees are distributed among the professors; one-fourth provides, with the government grant, for all other expense. A bequest yielding \$200 per annum supports the college library.

Laboratory facilities : This disposition of funds is reflected in the condition of the medical college : it possesses an ordinary, ill smelling dissecting-room and a single utterly wretched laboratory for pathology, bacteriology, and histology. A microscope is provided for each student. Though this same "laboratory" serves for the provincial board of health, no animals are used. There is no museum worthy the name, and no laboratory work in physiology or pharmacology. The laboratory sciences have been starved that small dividends might be paid to generally prosperous practitioners.

Clinical facilities : Clinical instruction is provided at the Victoria General Hospital,—a government institution of some 200 beds, open to the medical school. About 70 per cent of the cases are surgical. The staff appointments are made by the government for its own reasons ; the medical college is forced to confer professorships on these appointees. Ward classes are conducted ; individual cases are assigned, and the student's notes become part of the hospital records. Instruction in clinical microscopy is very limited.

Obstetrical opportunities barely suffice. Autopsies are performed in the presence of students, who report on them. The college has no dispensary, but students are required to attend the city dispensary,—an institution within which the medical school has no authority. The attendance is fair.

It has been stated above that except during part of the first two years Dalhousie University has no teaching responsibility for or connection with Halifax Medical College. On the other hand, students of Halifax Medical College are examined by the medical faculty of Dalhousie University and obtain the Dalhousie medical degree. The question may fairly be asked: What is the value of the Dalhousie degree in medicine, won by students whose opportunities have been provided by Halifax Medical College? The connection is, from the standpoint of Dalhousie University, highly objectionable.

Date of visit : October, 1909.

ONTARIO

KINGSTON: *Population*, 20,000.

(3) MEDICAL DEPARTMENT OF QUEEN'S UNIVERSITY. Organized 1854. The relation of the medical department to the university is anomalous, marking a period of transition that is likely soon to result in complete integration.

Entrance requirement: Heretofore somewhat below that of the arts department of the university, though students must comply with the requirements of the province in which they expect to practise. The medical course covers five years.

Attendance: 208, 71 per cent from Ontario.

Teaching staff: 38, 16 being professors.

Resources available for maintenance: Income in fees, \$19,978. A fixed percentage of fees is annually expended on buildings, equipment, and maintenance. The remainder belongs to and is disbursed by the medical faculty.

Laboratory facilities: The laboratory building is new and the equipment is adequate to intelligent routine work. At present, physics, chemistry, and physiology are taught in the university, in return for which the university receives a part of the fees of the students instructed. Full-time professors in anatomy and pathology are provided by the medical school. A museum is in process of formation. There is a small collection of books and periodicals in the faculty room, open to students.

Clinical facilities: The clinical facilities are limited. The school relies mainly on the adjoining Kingston General Hospital, in which its faculty practically constitutes the staff. The average number of beds available is 80, but they are well used. In addition to ward work, students are required to work up individual cases in correct form, including the clinical laboratory aspects. There is a ward for infectious diseases. Obstetrical cases are too few. Post-mortems are secured mainly at the Rockwood Insane Asylum. Two supplementary hospitals provide additional illustrative clinical material. The opportunities for out-patient work are slight.

Date of visit: October, 1909.

LONDON: *Population*, 41,500.

(4) WESTERN UNIVERSITY MEDICAL DEPARTMENT. Established 1881. Practically an independent school.

Entrance requirement: Nominal. The student, for his own protection, is expected to fulfil the requirements of the place in which he intends to practise. The medical course covers four years.

Attendance: 104.

Teaching staff: 20, of whom 8 are professors, 12 of other grade.

Resources available for maintenance: Fees, amounting to \$11,590 (estimated).

Laboratory facilities: These consist of a single room called the laboratory of pathology, bacteriology, and histology, whose equipment consists of microscopes and some unlabeled specimens,—no microtome, cut sections, incubator, or sterilizer being visible,—a wretched chemical laboratory, and an ordinary dissecting-room. There is no outfit for physiology, pharmacology, or clinical microscopy, and no museum deserving the name. There are a few hundred books, locked in cases to which the janitor carries the key.

Clinical facilities: These are entirely inadequate. They are confined almost wholly to a small number of beds in the municipal hospital.

The school has no dispensary.

Date of visit: October, 1909.

TORONTO: Population, 328,911.

(5) UNIVERSITY OF TORONTO FACULTY OF MEDICINE. Established 1887. An organic department of the university.

Entrance requirement: The Junior Matriculation Examination, strictly enforced. The course covers five years.

Attendance: 592.

Teaching staff: 68, of whom 27 are professors, 41 of other grade. Ten professors with fifteen assistants give their entire time to teaching and research.

Resources available for maintenance: The department is supported out of the general funds of the university, its cost being considerably in excess of fees received. The latter amount to \$64,500.

Laboratory facilities: The laboratories are in point of construction and equipment among the best on the continent. Increasing attention has recently been devoted to the cultivation of research. There are both general and departmental libraries, an excellent museum, and all necessary teaching accessories.

Clinical facilities: The school has recently perfected a very intimate relationship with the new Toronto General Hospital, by which its faculty obtains complete control of the clinical advantages of some 500 beds. Students have free access to all wards, clinical laboratory, dispensary, etc. Other large local hospitals—general and special—are also available.

Date of visit: March, 1909.

QUEBEC

MONTREAL: *Population, 267,730.*

(6) **MCGILL UNIVERSITY MEDICAL FACULTY.** Established 1824. An organic department of the university.

Entrance requirement: The University School Leaving Examination, strictly enforced. The medical course covers five years.

Attendance: 328.

Teaching staff: 99, of whom 19 are professors, 80 of other grade. Ten instructors devote their entire time to teaching.

Resources available for maintenance: The department has separate endowments aggregating \$350,000 and is assisted out of the general university funds. Its fees amount to \$43,750; its budget, \$77,000.

Laboratory facilities: The laboratories having been recently injured by fire, the school is now waiting the completion of its new buildings, for which ample funds have been secured. Meanwhile its temporary quarters, well equipped for both teaching and research in all departments, show what energy and intelligence can accomplish in the face of disaster. The anatomical and pathological museums are among the most famous on the continent. The school possesses an excellent library and all necessary teaching accessories.

Clinical facilities: These are excellent. The school enjoys a most favorable relation to two large hospitals, of about 500 beds, besides several other institutions. Students work freely in all the wards and clinical laboratory.

The dispensary service is large and admirable.

Date of visit: March, 1909.

(7) **LAVAL UNIVERSITY MEDICAL DEPARTMENT.** Organized 1878. The university connection is not intimate.

Entrance requirement: Indefinite, depending on the prospective location of the student. The medical course covers five years.

Attendance: 217.

Teaching staff: 8.

Resources available for maintenance: Fees, most of which are distributed among the teachers.

Laboratory facilities: Chemistry is given by the university. Anatomy is limited to dissecting. A single laboratory with meager equipment is assigned to pathology,

bacteriology, and histology. There is a library and a small collection of specimens, not all labeled.

Clinical facilities: The school has access to two hospitals, containing together 250 beds. The dispensary has a fair attendance.

Date of visit: March, 1909.

QUEBEC: *Population*, 70,000.

(8) LAVAL UNIVERSITY MEDICAL DEPARTMENT. Organized 1848. An organic part of Laval University.

Entrance requirement: Indefinite, depending on the student's prospective location.

As most graduates locate in the province—French being the language of instruction—they must comply with the provincial requirement. The medical course covers five years.

Attendance: 92.

Teaching staff: 22.

Resources available for maintenance: Fees and an appropriation by the university.

Laboratory facilities: Instruction in chemistry and physics is provided by the university; in the medical building, recent, though not extensive, laboratory provision is made for anatomy, histology, bacteriology, and pathology. There is no experimental physiology or pharmacology. A library for students and a museum have been started lately. The buildings are admirably kept.

Clinical facilities: Clinical instruction in medicine, surgery, and pediatrics is given at the Charity Hospital (Hôtel Dieu), to the free wards of which the faculty serves as staff. The amount of material is limited in quantity; the staff rotates monthly. The hospital contains a clinical laboratory, in which instruction is given in connection with ward work. The fifth year, now required, and a proposed reorganization of staff and teaching arrangements promise to improve the instruction. Obstetrical opportunity is abundant.

The dispensary has a sufficient attendance.

Date of visit: October, 1909.

General Considerations

IN the matter of medical schools, Canada reproduces the United States on a greatly reduced scale. Western University (London) is as bad as anything to be found on this side the line; Laval and Halifax Medical College are feeble; Winnipeg and Kingston represent a distinct effort toward higher ideals; McGill and Toronto are excellent. The eight schools of the Dominion thus belong to three different types, the best adding a fifth year to their advantages of superior equipment and instruction.

At this moment the needs of the Dominion could be met by the four better English schools and the Laval department at Quebec. Toronto has practically reached the limits of efficiency in point of size; McGill and Manitoba are capable of considerable expansion. The future of Kingston is at least doubtful. It could certainly maintain a two-year school; for the Kingston General Hospital would afford pathological and clinical material amply sufficient up to that point. But the clinical years require much more than the town now supplies. Its location—halfway between Montreal and Toronto, on an inconvenient branch-line—greatly aggravates the difficulties due to the smallness of the community. The rapid development of the Northwest Territory will undoubtedly hasten the growth of the Winnipeg school; other institutions will in time be established nearer the Pacific coast as the country grows in population.

The legal standard in the Dominion has not thus far been high; but it has practically been elevated a year by the general movement to prolong the course to five years. Meanwhile, the high quality of instruction offered by McGill and Toronto to students who enter on less than a four-year high school education proves that our trouble in the United States has been at bottom not less one of low ideals than of low standards. Indeed, where ideals are low, there are no standards; and where ideals are high, the standard, even though low, is at any rate so definite that it furnishes a sure starting-point towards a clearly apprehended goal. The low standard school in the United States has had no such starting-point and no such goal.

APPENDIX

**TABLE SHOWING NUMBER IN FACULTY, ENROLMENT,
FEE INCOME, BUDGET OF SCHOOLS BY STATES**

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INSTITUTION (Half-schools marked *)	Number of Pro- fess- ors	Number of Other In- structors	Number of Students	Total Annual Income from Fees	Annual Budget ³
IA					
Ingham Medical College.....	18	12	185	\$ 14,550 ¹	.....
University of Alabama, Medical Department.....	8	17	204	17,300 ⁴	.....
AS					
University of Arkansas, Medical Department.....	18	17	179	14,100 ¹	.....
College of Physicians and Surgeons (Little Rock).....	25	9	81	6,450 ¹	.....
LNIA					
College of Physicians and Surgeons (Los Angeles).....	28	13	32	4,075 ¹	.....
UCLA Eclectic Medical College.....	26	1	9	1,060 ¹	.....
UCLA College of Osteopathy.....	19	.....	"More than 250"	37,500 ¹	.....
UCLA College of Osteopathy.....	19	19	85	12,750 ¹	.....
UCLA College of Medicine and Surgery.....	13	19	17	2,760 ¹	.....
UCLA Medical College of the Pacific.....	13	22	23	2,685 ¹	.....
UCLA College of Physicians and Surgeons (San Francisco).....	23	30	70	7,715 ¹	.....
UCLA Stanford Junior University, College of Medicine.....	16	5	16 ¹	.....	.....
University of California, Medical Department.....	12	48	36	7,004	\$33,396
DO					
University of Colorado, School of Medicine.....	25	20	85	4,043	28,000
University of Colorado and Gross College of Medicine (University of Denver).....	44	35	109	12,624 ¹	.....
TICUT					
Medical School.....	14	50	138	15,325	43,311
T OF COLUMBIA					
University of Washington, Department of Medicine.....	25	44	117	21,833	23,779
Columbia University, Department of Medicine.....	20	54	89	11,000	.....
Columbia University, Medical Department.....	22	30	205	26,000	40,000 ⁴
A					
Atlanta College of Physicians and Surgeons.....	20	31	286	28,000	.....
Atlanta School of Medicine.....	17	27	230	20,000 ¹	.....
Atlanta College of Eclectic Medicine and Surgery.....	14	6	66	5,655 ¹	.....
Atlanta Medical College.....	16	.....	43	3,950 ¹	.....
Atlanta College of Georgia (University of Georgia).....	18	15	99	6,835	.....
S					
University of Chicago Medical College (University of Chicago).....	89	141	488	60,485 ⁵	82,452
Forwarded.....	562	665	3,142	\$343,699	.....

led. ¹ First year in operation.

² Information under this heading may mean one of several things: in proprietary schools there is no budget, because no plans are made; necessary expenses are met and the balance is divided or is used to reduce debts; in many university departments the expense is much greater than fee income, is so involved with expenses incurred for other laboratory purposes that it cannot be stated; in such instances, it cannot be definitely stated what the cost of the department is.

³ State appropriation of \$8000 which pays for scholarships.

⁴ See source: *Universities of Chicago* - see on Third and fourth years. *UCLA Medical College* - see on

INSTITUTION (Half-schools marked *)	Number of Pro- fess- ors	Number of Other In- structors	Number of Students	Total Annual Income from Fees	Ann Bdg
<i>Carried forward</i>	562	665	3,142	\$343,699	
ILLINOIS (Continued)					
26. Northwestern University Medical School	54	89	522	89,076	\$68.9
27. College of Physicians and Surgeons (University of Illinois)	42	156	517	80,155 ¹	
American Medical Missionary College		See Michigan			
28. Hahnemann Medical College and Hospital of Chicago	38	46	130	14,300 ¹	
29. Chicago College of Medicine and Surgery	37	34	366	43,430 ¹	
30. Hering Medical College	30	14	32	3,360 ¹	
31. Illinois Medical College	38	35	69	9,175 ¹	
32. Bennett Medical College	21	21	181	19,380 ¹	
33. College of Medicine and Surgery—Physio-medical	33	9	33	2,935 ¹	
34. Jenner Medical College	28	9	112	12,880 ¹	
35. National Medical University	36		150	22,500 ¹	
36. Reliance Medical College	23	21	83	9,945 ¹	
37. Littlejohn College of Osteopathy	43		75	11,250 ¹	
INDIANA					
38. Indiana University, School of Medicine	99	76	266	31,240 ¹	
39. * Valparaiso University, Medical Department			25		
IOWA					
40. Drake University College of Medicine	16	29	106	9,505	12.4
41. Still College of Osteopathy	13	2	115	17,250 ¹	
42. State University of Iowa, College of Medicine	12	20	267	13,707	35.2
43. State University of Iowa, College of Homeopathic Medicine	10	15	42	1,864	5.4
KANSAS					
44. University of Kansas, School of Medicine	24	39	89	5,030	40.0
45. Western Eclectic College of Medicine and Surgery	30	2	21	1,600 ¹	
46. Kansas Medical College (Washburn College)	31	16	65	4,876	
KENTUCKY					
47. University of Louisville, Medical Department	40	50	600	75,125	
48. Southwestern Homeopathic Medical College	12	15	13	1,100 ¹	
49. Louisville National Medical College	17	6	40	2,560 ¹	
<i>Forwarded</i>	1,289	1,269	7,061	\$825,942	

¹ Estimated.

² The university hospital budget is \$33,745.

³ Hospital budget, \$7847.

INSTITUTION (Half-schools marked *)	Number of Pro- fes- sors	Number of Other In- structors	Number of Students	Total Annual Income from Fees	Annual Budget
Carried forward	1,289	1,269	7,061	\$825,942	
LOUISIANA					
Tulane University of Louisiana, Medical Department	17	58	439	67,500	\$101,781
Flint Medical College	6	9	24	1,300	
MAINE					
Medical School of Maine (Bowdoin College).....	14	21	81	8,100	15,700
MARYLAND					
Johns Hopkins University, Medical Department	23	89	297	60,542	102,439
College of Physicians and Surgeons (Baltimore).....	21	38	252	39,000 ¹	
University of Maryland, School of Medicine.....	24	37	316	44,530	
Baltimore Medical College.....	20	43	392	33,424	
Woman's Medical College of Baltimore.....	18	13	32	2,000 ¹	
Maryland Medical College.....	21	18	95	7,460 ¹	
Atlantic Medical College.....	12	35	43	3,905 ¹	
MASSACHUSETTS					
Harvard University Medical School	23	150	285	72,037	251,389
Boston University School of Medicine.....	29	35	90	12,762 ¹	
Tufts College Medical School	33	70	384	59,093	
College of Physicians and Surgeons (Boston)	30	15	172	10,000 ¹	
Massachusetts College of Osteopathy.....	19	15	90	11,400 ¹	
MICHIGAN					
University of Michigan, Department of Medicine and Surgery	22	41	389	34,093	83,000
University of Michigan Homeopathic College.....	15	11	80	4,515	16,400
American Medical Missionary College	22	10	75	4,778 ¹	
Detroit College of Medicine	25	79	161	22,000 ¹	
Detroit Homeopathic College.....	17	18	34	3,010 ¹	
MINNESOTA					
University of Minnesota, College of Medicine and Surgery.....	49	71	174	16,546	71,336
MISSISSIPPI					
Mississippi Medical College.....	12	7	100	7,500 ¹	
University of Mississippi, Medical Department.....	14	13	39	3,500	15,000
MISSOURI					
* University of Missouri, School of Medicine.....	8	6	47	2,320	31,000
<i>Forwarded</i>	1,783	2,171	11,142	\$1,357,757	

¹ Estimated.

² Not including university hospital budget of \$70,000.

³ Hospital budget, \$31,000.

INSTITUTION (Half-schools marked *)	Number of Pro- fess- ors	Number of Other In- structors	Number of Students	Total Annual Income from Fees	Ann Bnd
<i>Carried forward</i>	1,783	2,171	11,142	\$1,357,757	
MISSOURI (Continued)					
74. University Medical College.....	30	35	174	17,800 ¹	-----
75. Kansas City Hahnemann Medical College.....	33	8	59	5,900 ¹	-----
76. Central College of Osteopathy.....	20	-----	40	4,500 ¹	-----
77. American School of Osteopathy.....	12	11	560	89,800 ¹	-----
78. Ensworth Medical College.....	32	8	72	7,060 ¹	-----
79. Washington University, Medical Department.....	48	51	178	21,000	\$51
80. St. Louis University School of Medicine.....	39	82	243	26,630 ¹	37
81. St. Louis College of Physicians and Surgeons.....	25	24	224	16,035 ¹	-----
82. Barnes Medical College.....	39	25	124	12,400 ¹	-----
83. American Medical College.....	25	3	28	3,801 ¹	-----
84. Hippocratean School of Medicine.....	30	8	31	3,315 ¹	-----
NEBRASKA					
85. University of Nebraska, College of Medicine.....	38	46	122	4,905	20
86. Lincoln Medical College (Cotner University).....	34	-----	42	3,794 ¹	-----
87. John A. Creighton Medical College (Creighton University).....	28	21	175	17,850 ¹	-----
NEW HAMPSHIRE					
88. Dartmouth Medical School (Dartmouth College).....	17	7	58	5,583 ¹	-----
NEW YORK					
89. Albany Medical College (Union University).....	16	78	180	20,276	-----
90. University of Buffalo Medical Department.....	38	59	193	31,984	-----
91. College of Physicians and Surgeons, New York City (Columbia University)	38	138	312	75,500	239
92. Cornell University Medical College.....	32	100	207	24,410	209,88 32,840
93. Eclectic Medical College of the City of New York.....	16	29	96	8,311	-----
94. Fordham University School of Medicine.....	32	40	42	7,330 ¹	-----
95. Long Island College Hospital.....	9	85	360	61,398	-----
96. New York Homeopathic Medical College.....	31	34	159	18,658	-----
97. New York Medical College for Women.....	23	22	24	2,545	-----
98. University and Bellevue Hospital Medical College (New York University)	37	127	408	76,115	87
99. Syracuse University, College of Medicine.....	15	42	151	28,861	-----
<i>Forwarded</i>	2,520	3,254	15,404	\$1,953,118	

¹ Estimated.

² Hospital budget, \$30,000.

³ Including Sloane Maternity Hospital and Vanderbilt Clinic.

INSTITUTION (Half-schools marked *)	Number of Pro- fess- ors	Number of Other In- structors	Number of Students	Total Annual Income from Fees	Annual Budget
<i>led forward</i>	2,520	3,254	15,404	\$1,953,118	
CAROLINA					
iversity of North Carolina, Medical Department.....	10	5	74	6,500	\$ 12,000
th Carolina Medical College	19	13	94	8,345 ¹	
uard Medical School (Shaw University).....	8	1	125	2,846	
ake Forest College, School of Medicine.....	6		53	2,225	
DAKOTA					
ate University of North Dakota, College of Medicine.....	9	7	9	450	6,800
o-Miami Medical School (University of Cincinnati).....	50	76	197	26,345	
ctic Medical Institute.....	12	12	86	7,500 ¹	
to Medical College	24	12	16	1,325 ¹	
reland College of Physicians and Surgeons.....	18	41	89	9,520 ¹	
reland Homeopathic Medical College.....	30	31	46	5,750 ¹	
stern Reserve University, Medical Department.....	18	82	96	11,000	63,000
ling-Ohio Medical College.....	32	28	220	27,500 ¹	
xdo Medical College	16	32	32	3,240 ¹	
LOUISIANA					
ate University of Oklahoma, School of Medicine.....	9		22	600	
north University College of Medicine	28	14	51	4,285 ¹	
NEBRASKA					
iversity of Oregon, Medical Department.....	14	27	72	8,000 ¹	
lamette University, Medical Department.....	15	1	29	3,580 ¹	
PENNSYLVANIA					
iversity of Pennsylvania, Department of Medicine.....	26	131	546	104,612	131,355 ²
erson Medical College	22	100	591	102,995	
lico-Chirurgical College of Philadelphia	23	86	480	48,281 ¹	
nan's Medical College of Philadelphia	25	27	125	15,480	
uemann Medical College, Philadelphia.....	27	45	182	18,500	
ple University, Department of Medicine	15	70	136	17,000 ¹	
adelphia College of Osteopathy.....	11	7	126	18,900 ¹	
iversity of Pittsburgh, Medical Department.....	43	60	315	48,500	
<i>Forwarded</i>	3,080	4,162	19,218	\$2,456,297	

led. ² *Exclusive of hospital and dispensary.*

INSTITUTION (Half-schools marked *)	Number of Pro- fess- ors	Number of Other In- structors	Number of Students	Total Annual Income from Fees	Ann Bud
<i>Carried forward</i>	3,080	4,162	19,218	\$2,456,397	
SOUTH CAROLINA					
123. Medical College of the State of South Carolina	11	23	213	19,447	.....
SOUTH DAKOTA					
124. *University of South Dakota, College of Medicine	5	5	7	660	.....
TENNESSEE					
127. Chattanooga Medical College (University of Chattanooga).....	11	14	112	4,290 ¹	.....
128. Tennessee Medical College (Lincoln Memorial University).....	26	5	82	4,994	.....
129. Knoxville Medical College.....	9	2	23	1,020 ¹	.....
130. College of Physicians and Surgeons (Memphis).....	22	25	77	7,400 ¹	.....
131. Memphis Hospital Medical College.....	12	23	442	34,600 ¹	.....
132. University of West Tennessee, Medical Department.....	14	.....	40	2,000 ¹	.....
133. Universities of Nashville and Tennessee, Medical Department.....	26	29	207	26,000 ¹	.....
134. Vanderbilt University, Medical Department.....	17	23	200	26,250	.....
135. Meharry Medical College (Walden University)	12	14	275	20,310	\$23.
TEXAS					
136. Baylor University, College of Medicine	16	13	53	7,735 ¹	.....
137. Southwestern University, Medical College	17	15	68	7,150 ¹	.....
138. Fort Worth University, Medical Department.....	14	33	100	10,500 ¹	.....
139. University of Texas, Medical Department.....	9	17	208	6,500	63.
UTAH					
140. *University of Utah, Department of Medicine	6	10	18	1,405	10.
VERMONT					
141. University of Vermont, College of Medicine	18	15	156	21,388	.....
VIRGINIA					
142. University of Virginia, Department of Medicine.....	12	19	89	10,060	52.
143. Medical College of Virginia.....	16	45	206	22,490 ¹	.....
144. University College of Medicine	22	52	121	14,975	.....
WEST VIRGINIA					
145. *West Virginia University, College of Medicine.....	7	.....	18	1,000 ¹	.....
WISCONSIN					
146. *University of Wisconsin, College of Medicine.....	7	16	49	.....	40.
147. Milwaukee Medical College (Marquette University).....	30	37	168	22,680 ¹	.....
<i>Forwarded</i>	3,369	4,597	22,148	\$2,729,251	

¹ Estimated.

² Hospital budget, \$39,611.

³ Including hospital deficit.

INSTITUTION (Half-schools marked *)	Number of Pro- fess- ors	Number of Other In- structors	Number of Students	Total Annual Income from Fees	Annual Budget
forward.....	3,369	4,597	22,148	\$2,739,351	
IN (CONTINUED)					
main College of Physicians and Surgeons.....	26	40	60	8,675	
A					
aba Medical College (University of Manitoba) ¹	22	18	115	14,000	
OTIA					
x Medical College (Dalhousie University).....	16	17	63	5,000	\$6,300
city of Toronto, Faculty of Medicine ¹	27	41	592	64,500	
's University, Medical Faculty ¹	16	22	206	19,978	
rn University, Medical Department ¹	8	12	104	11,590	
University, Medical Faculty ¹	19	80	328	43,750	77,000
University, Medical Department ¹ { Montreal	8		217		
Quebec	22		92		
Total.....	3,533	4,828	23,927	\$2,896,744	

course.

¹ Four-year course.



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